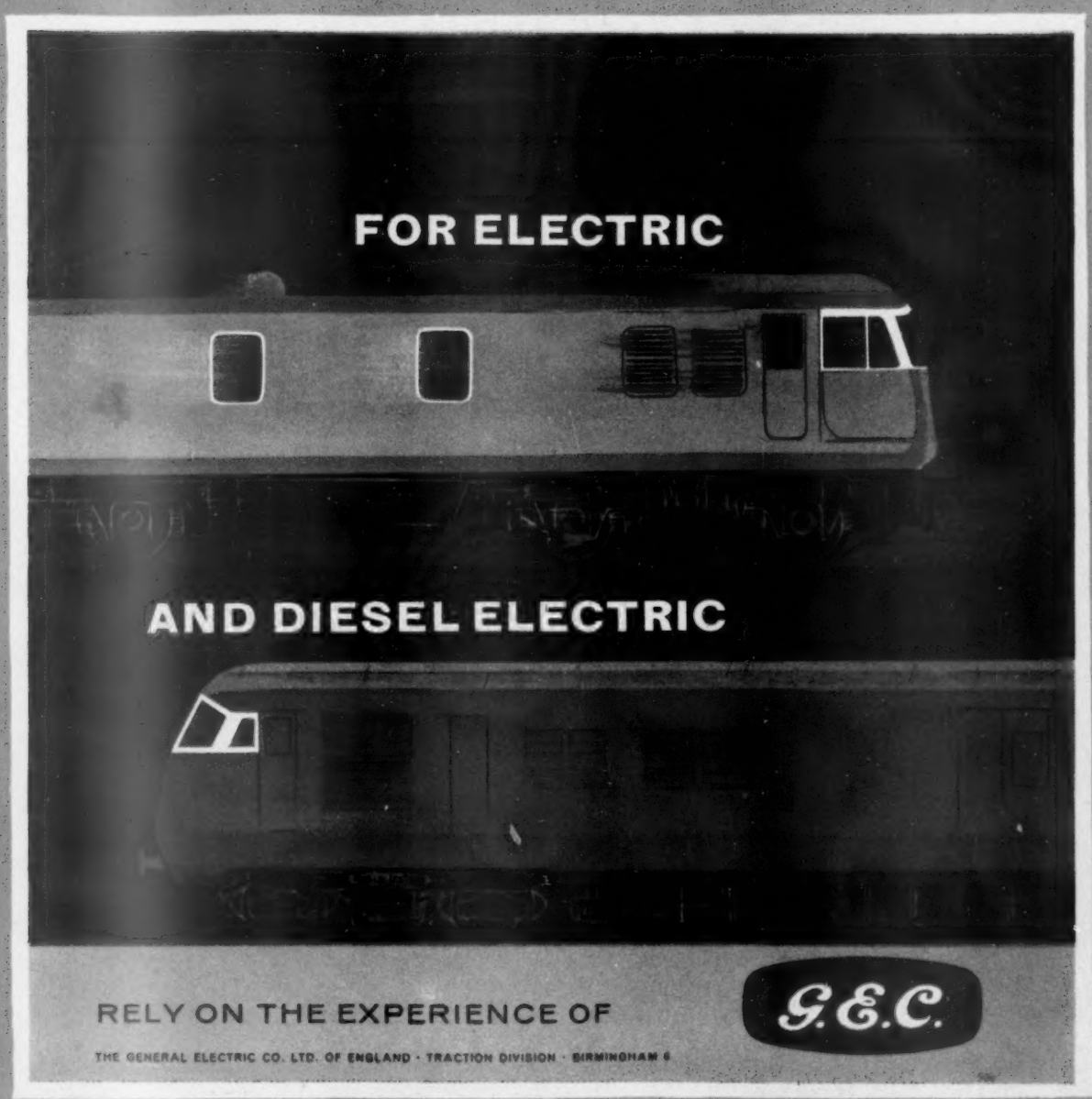
THE
RAILWAY GAZETTE

Price: Two Shillings | FRIDAY, SEPTEMBER 29, 1961 | Annually £5 by post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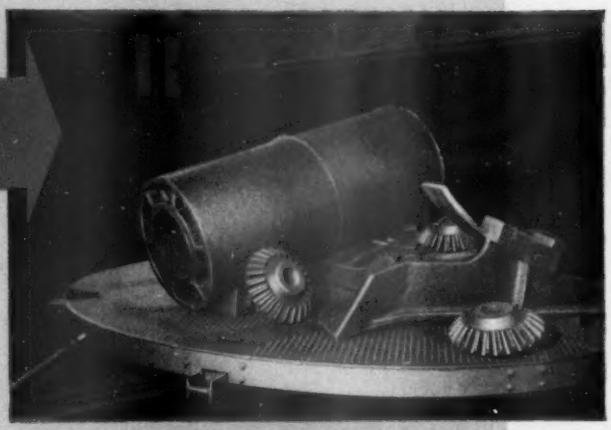
Foundry and Engineering Service for Industry

Our foundries and engineering shops, the largest in South Wales, provide a service, not only to the nation's steel industry, but to a variety of industries throughout Britain and the world.

STEEL CASTINGS BEING REMOVED AFTER SHOT BLASTING OPERATION



Carbon Steel Castings up to 10 tons.
Spheroidal Graphite Iron Castings up to 10 tons.
Non-Ferrous Castings up to 15 cwts.

The 'Centriblast' machine illustrated is capable of shot blasting 15 tons of material at one loading.

GAS MAINS BEING WELDED ON OUR 'FUSARC' MACHINE

Steel construction, Fabrication and General Repair Work.
All Types of Fabrication of mild and alloy steels up to 25 tons.

The 'Fusarc' welder has a 50 ft. straight run and a reach of 50 in.; it is also equipped to carry out 'submerged welding'.

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The Table Rollers illustrated are for the strip mill being built for the Ebbw Vale works by Davy & United Engineering Co. Ltd.

Richard Thomas & Baldwins Limited

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KENHI

Complete Range of

HYDRAULIC TRACK JACKS AND TOE JACKS.

HYDRAULIC RAIL BENDER.

There is a detailed, illustrated Booklet for each one of the above "Kenitra" products.

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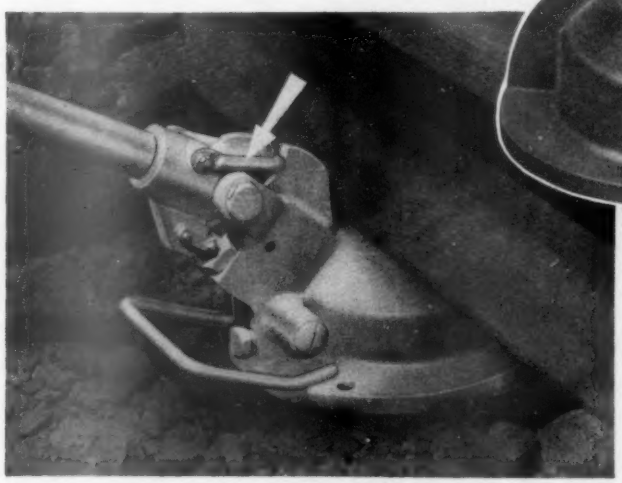
MODEL F.1054

HYDRAULIC

'MINI' TRACK JACK

OBSTRUCTIONLESS • SAFE • ROBUST

(Capacity 10 tons)



The Safety Catch (arrow) locks the Pump and the Handle for carrying and positioning the jack.

This latest "bottle-type" model, though extremely light and compact, gives greater lifting capacity with complete ease and safety in handling. It is absolutely obstructionless, involving a minimum of ballast displacement for operation, and requiring practically no maintenance.

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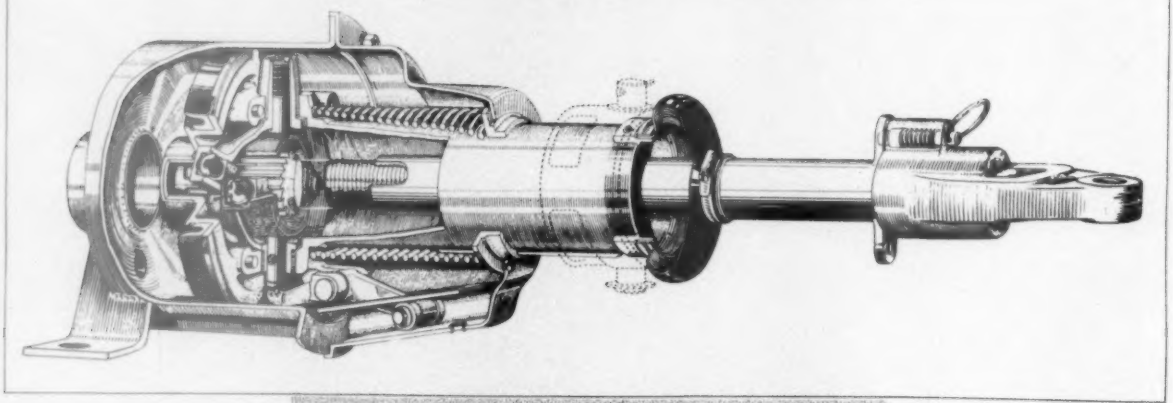
LIGHT INTEGRAL (75 lb.)
BRAKE CYLINDER AND SLACK ADJUSTER Type J.S.L.
for Bogie Mounting on Locomotives



Installation drawings and descriptive literature on request.
Please ask for Pamphlet A.545/5

Westinghouse Brake and Signal Co. Ltd., 82, York Way, London, N.1
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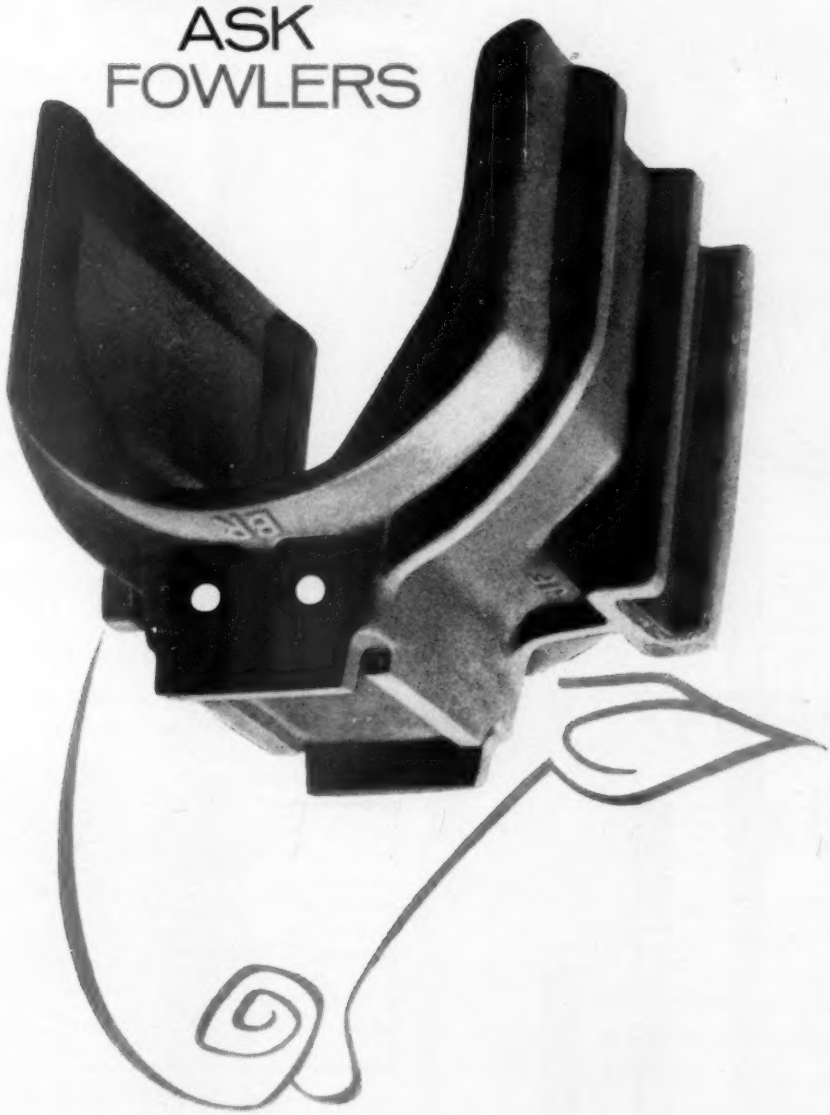
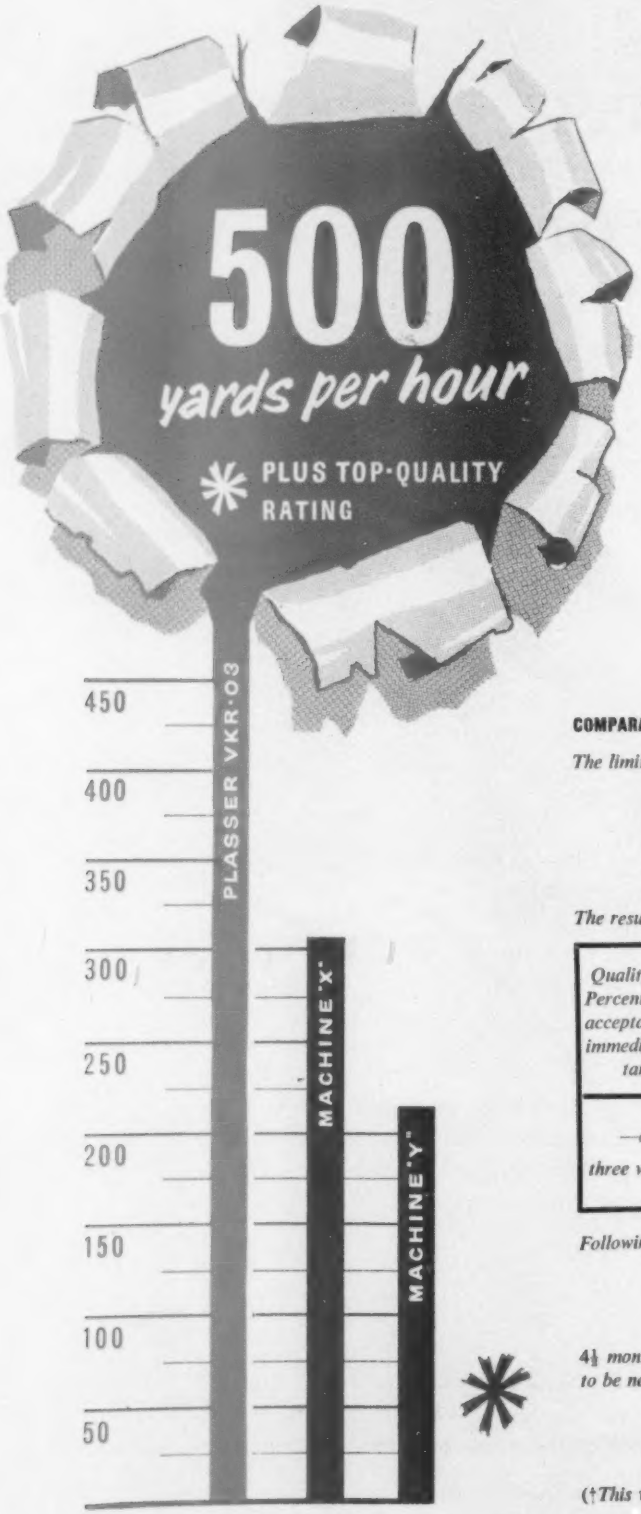


Technical Brochure from

JOHN FOWLER & CO (LEEDS) LTD Sprotborough Foundry, Sprotborough, Doncaster

outstanding achievement!



Remarkable results from Board of Trade Test carried out last May on three different manufacturers' normal production models on-track tamping machines. The results proved conclusively that the PLASSER VKR-03 is far superior to its competitors, both in speed and quality of work.

The test was carried out on a Class ' A ' track, average speed 75/80 m.p.h. 95 lb. B.H. material, 60′ rails, timber sleepers, on a compounded curve 62-85 chains radius, having cants of 3″ and 2″ respectively.

COMPARATIVE TESTS OF ON-TRACK BALLAST TAMPING MACHINES

The limits laid down were as follows:

i. For longitudinal level—Rate of change not to exceed $\frac{1}{16}$″ in 15′ 0″.
ii. For cross level—Variation not to exceed $\pm\frac{1}{4}$″.
iii. For voids—Not to exceed $\frac{1}{4}$″.

The results obtained were:

Quality of work Percentage inside *acceptable limits, immediately after tamping.*		*Machine 'X'*	*Machine 'Y'*	*PLASSER VKR-03*
	Longl. Level	77½	77	91
	Cross Level	28	59	77
	Voids	92	93	98
—ditto— three weeks later	*Longl. Level*	78	77	93
	Cross Level	8	41	45
	Voids	95	87½	98

Following the second set of measurements it was found:

(1) The cross level errors *outside* the acceptable limits on the Plasser length were reasonably constant and of the order of $\frac{1}{16}$″ to $\frac{1}{4}$″.

4½ months after the trials the following measured shovel packing was found to be necessary:

i. Machine ' X ' 95% of the test length was re-worked.
ii. Machine ' Y ' 83% of the test length was re-worked.
iii. PLASSER VKR-03 6% of the test length was re-worked.†

(†*This work was not necessary until two weeks before this report!*)

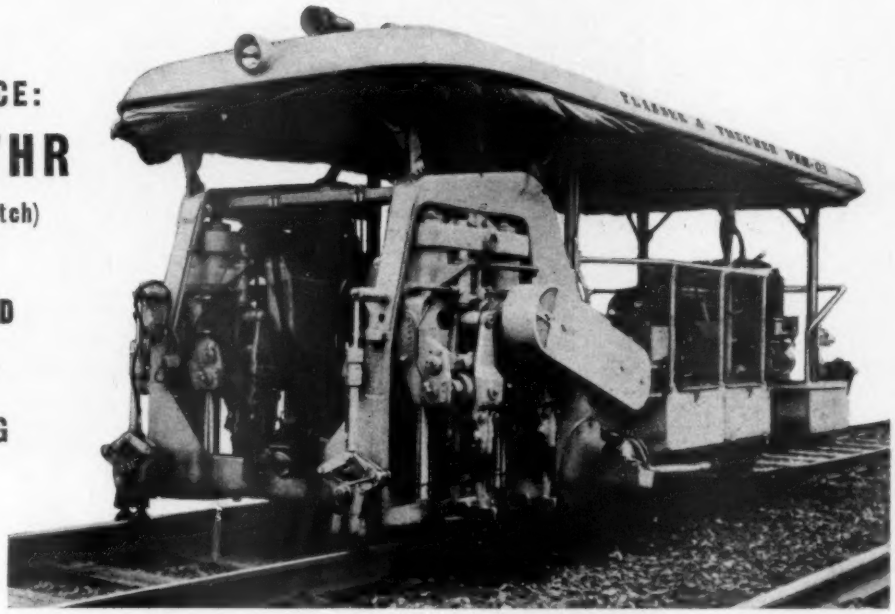
. . . for the PLASSER VKR-03

PEAK PERFORMANCE:

710 YARDS/HR

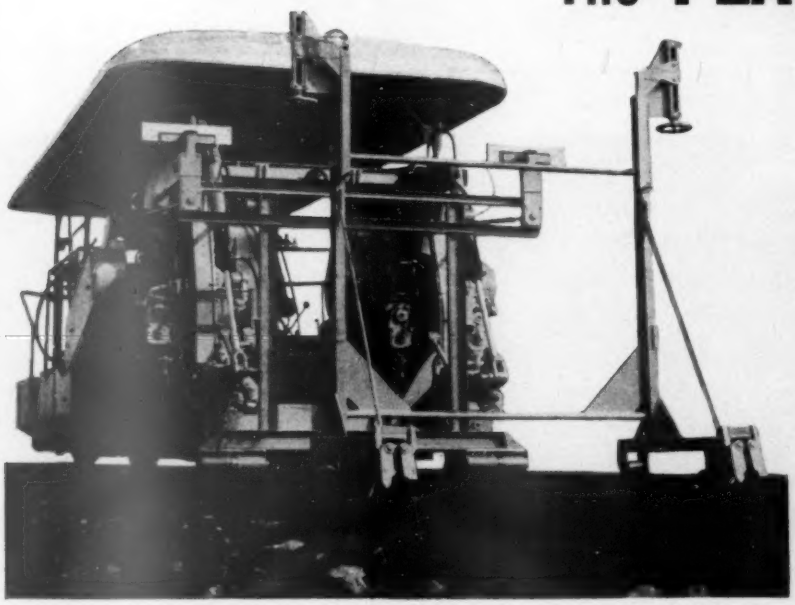
(According to sleeper pitch)

NON-SYNCHRONISED
FULLY HYDRAULIC
ON-TRACK TAMPING
MACHINE



Since 1960 over 150 PLASSERMATIC Machines sold including 20 to the British Transport Commission

The PLASSERMATIC VKR-04



The PLASSERMATIC VKR—04 Model has all the test-winning features of its predecessor but has, for the first time ever, levelling, lifting and tamping operations carried out *all by the same machine!*

For further information on the PLASSER range of Railway Track Maintenance Equipment, please contact:

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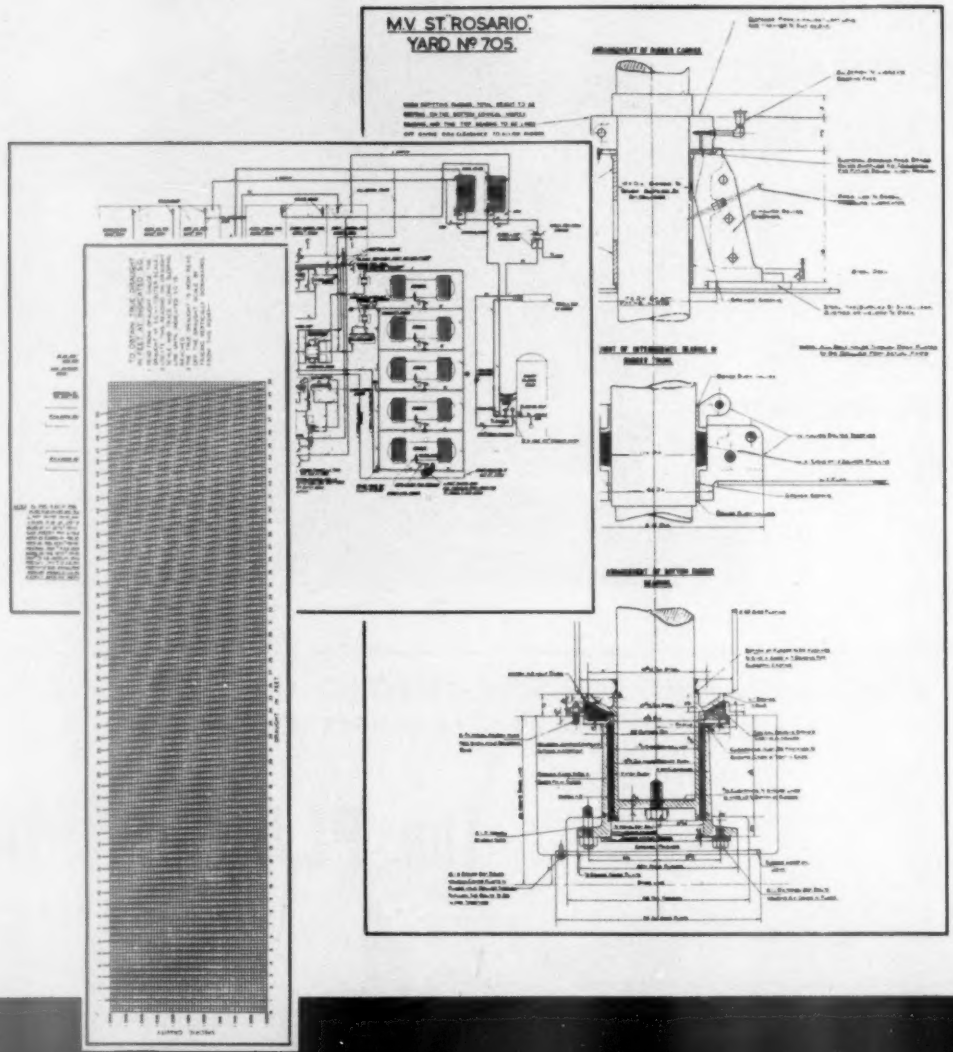
CONTROL DIAGRAMS



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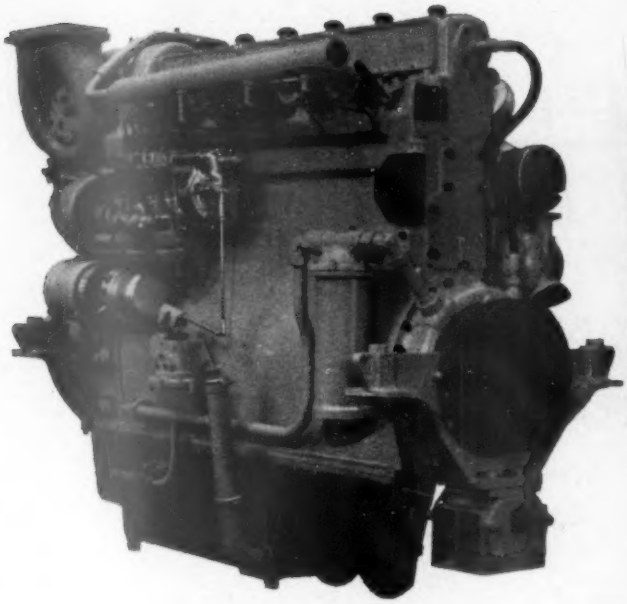

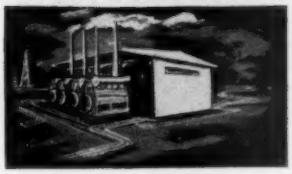

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the engine which is given the most varied applications

175 CO

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It is indispensable wherever a cheap source of motive power and a machine with reduced floor-space are required.

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— double oil sump and double oil pump : contact minimized between oil and combustion gas, longer life for the oil bath,
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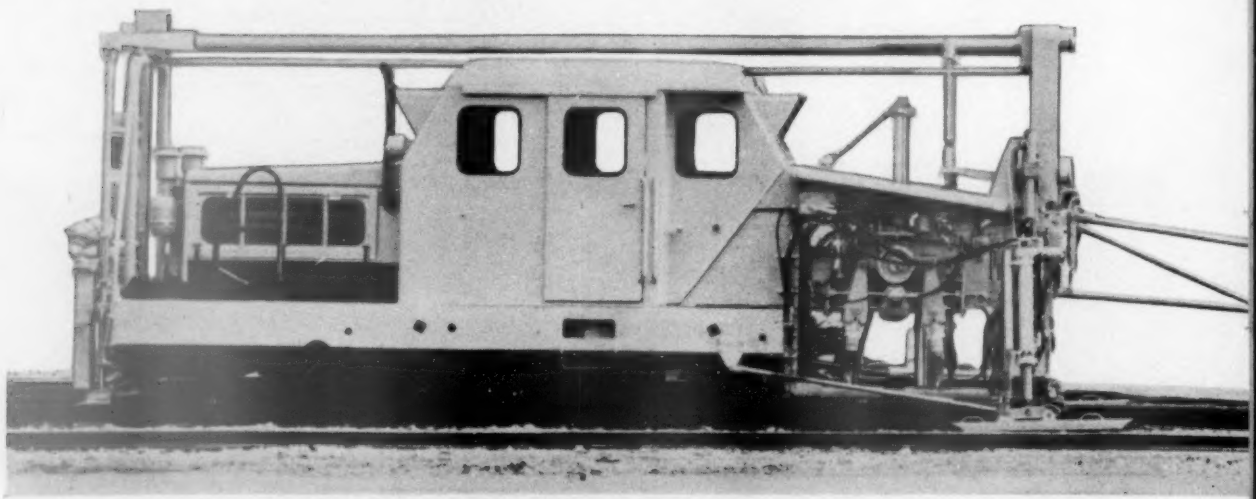
BY ONE MAN
AT NORMAL RATE OF TAMPING

PRECISION	*± 1 mm. in both longitudinal and transverse profiles*
SPEED	*Simultaneous levelling and tamping*
ECONOMY	*One man replaces the normal levelling and jacking gang*

65 Matisa B.60 Level-Tampers sold in less than a year



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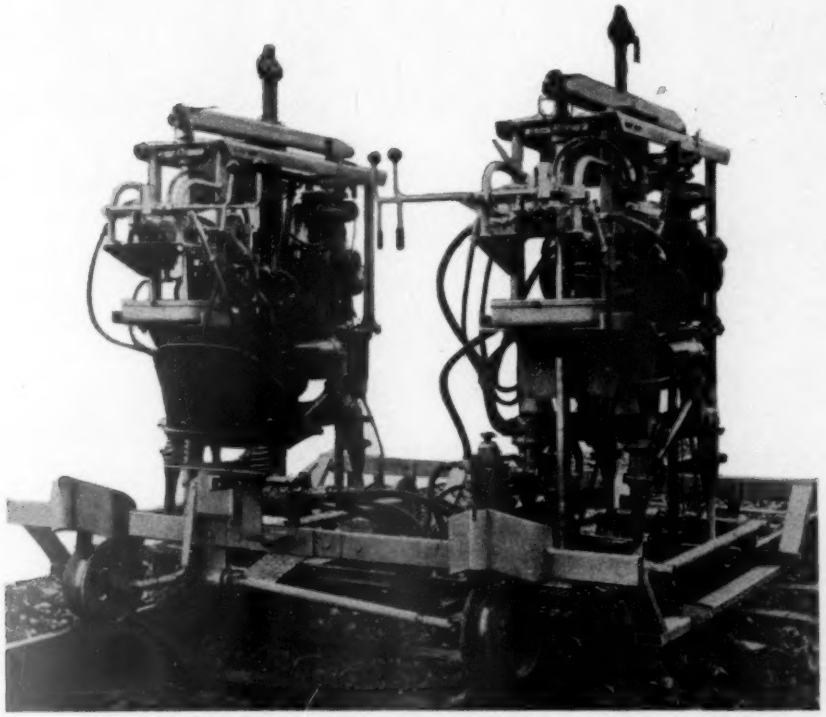

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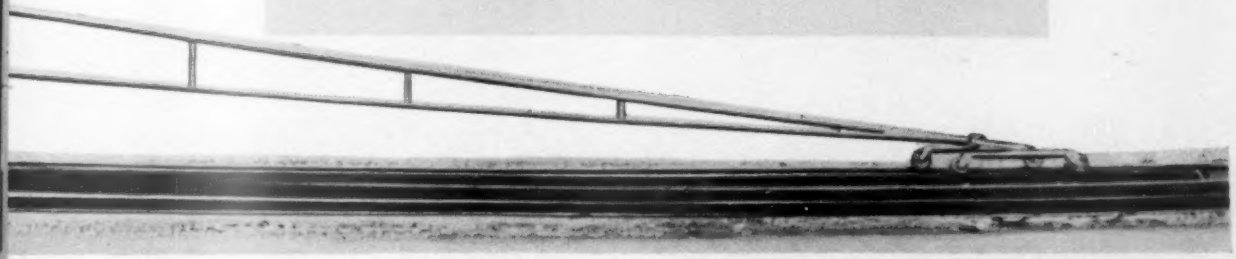
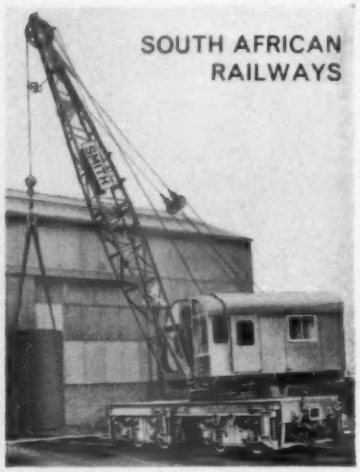
200 of these in the last 6 months

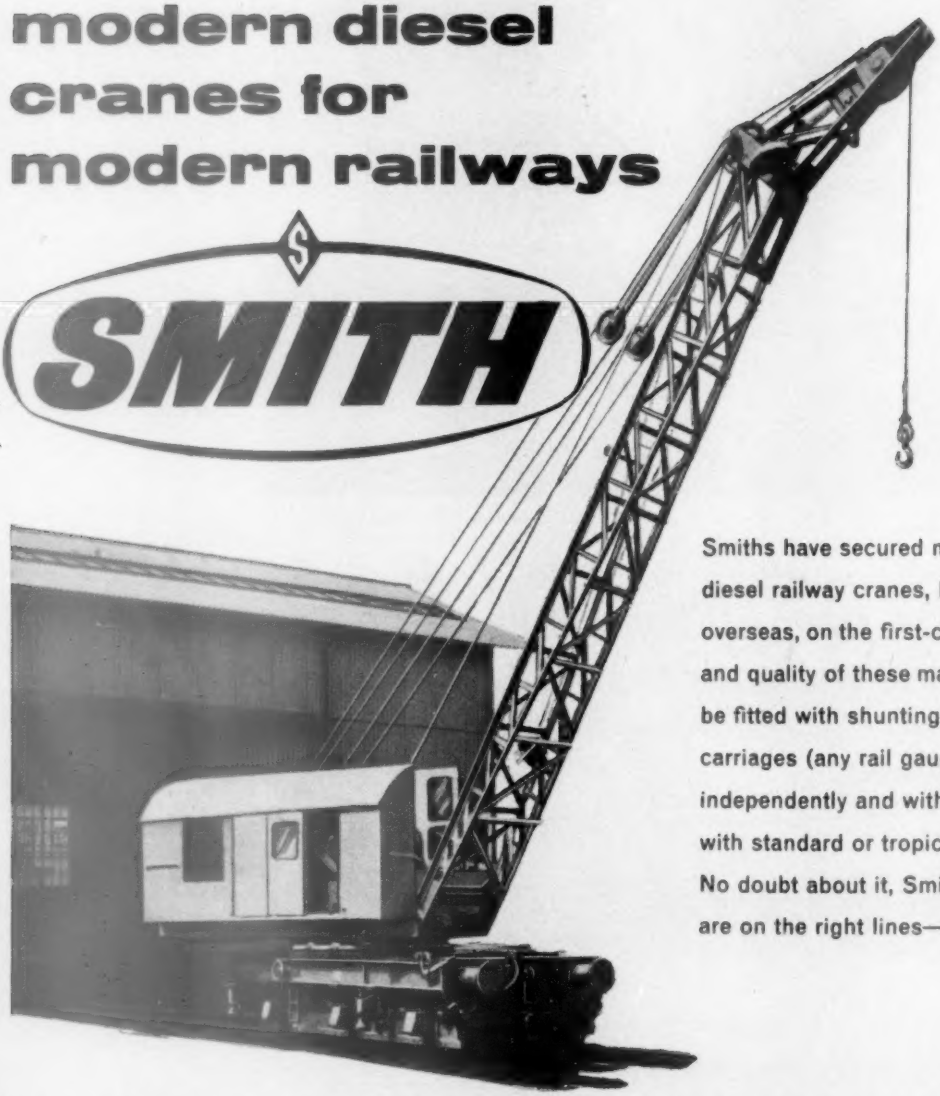


Associated Companies and Agents throughout the world.



modern diesel cranes for modern railways

SMITH



Smiths have secured many contracts for diesel railway cranes, both in Britain and overseas, on the first-class design, efficiency and quality of these machines. They can be fitted with shunting or non-shunting carriages (any rail gauge), to travel independently and with rolling stock; and with standard or tropical cabs, as specified. No doubt about it, Smith railway cranes are on the right lines—all over the world!

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When a call is received at a signal box from a driver or lineside staff, it is imperative that the signalman should have positive knowledge of the exact signal post from which the call is made; verbal information from the caller is not considered to be sufficiently safe. STC systems give a Positive Visual Indication of the signal post from which the call is originated. Conversation between the caller and the signalman is secret—an engaged signal being given to any other caller who attempts to call the cabin while the line is in use.

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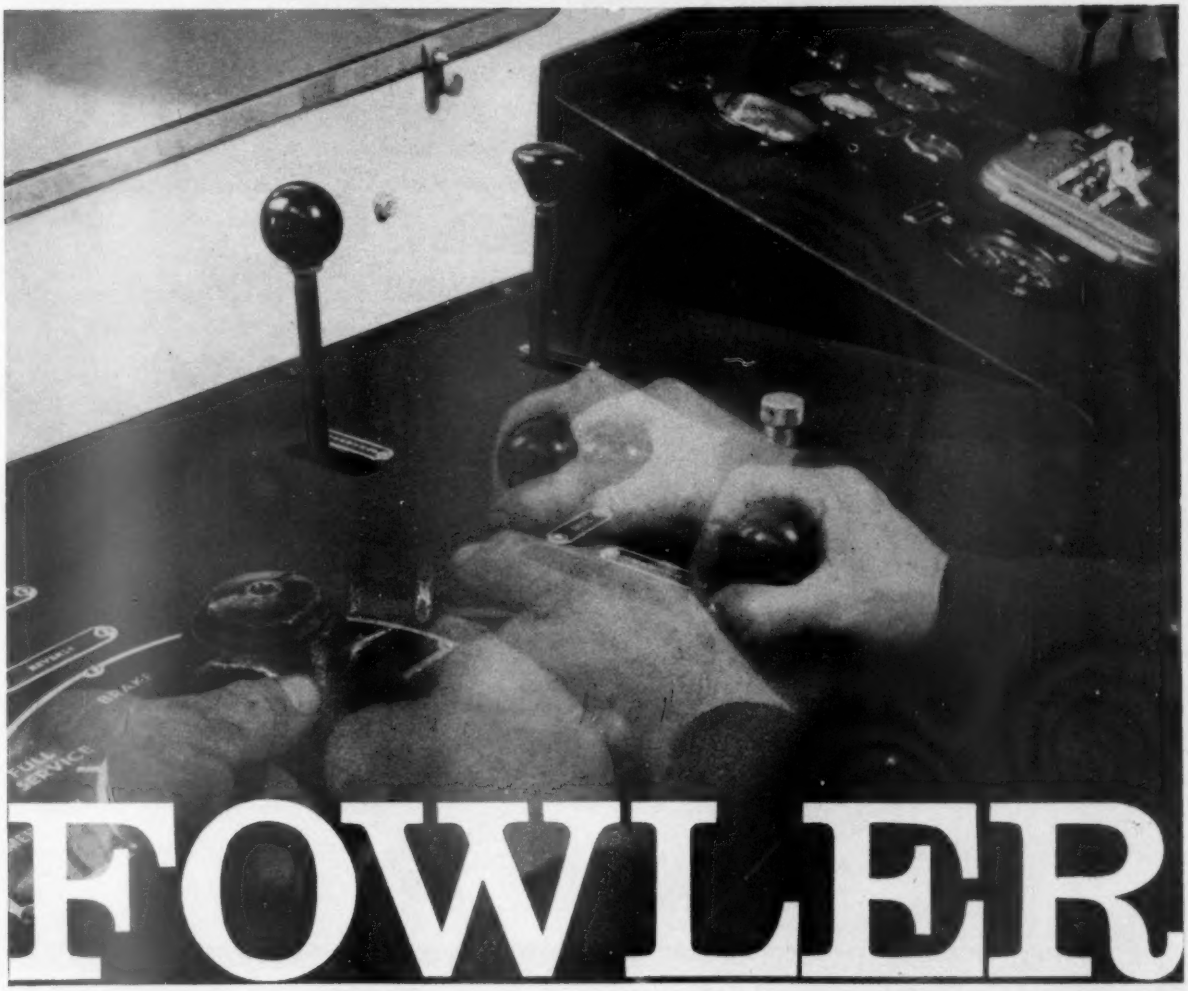

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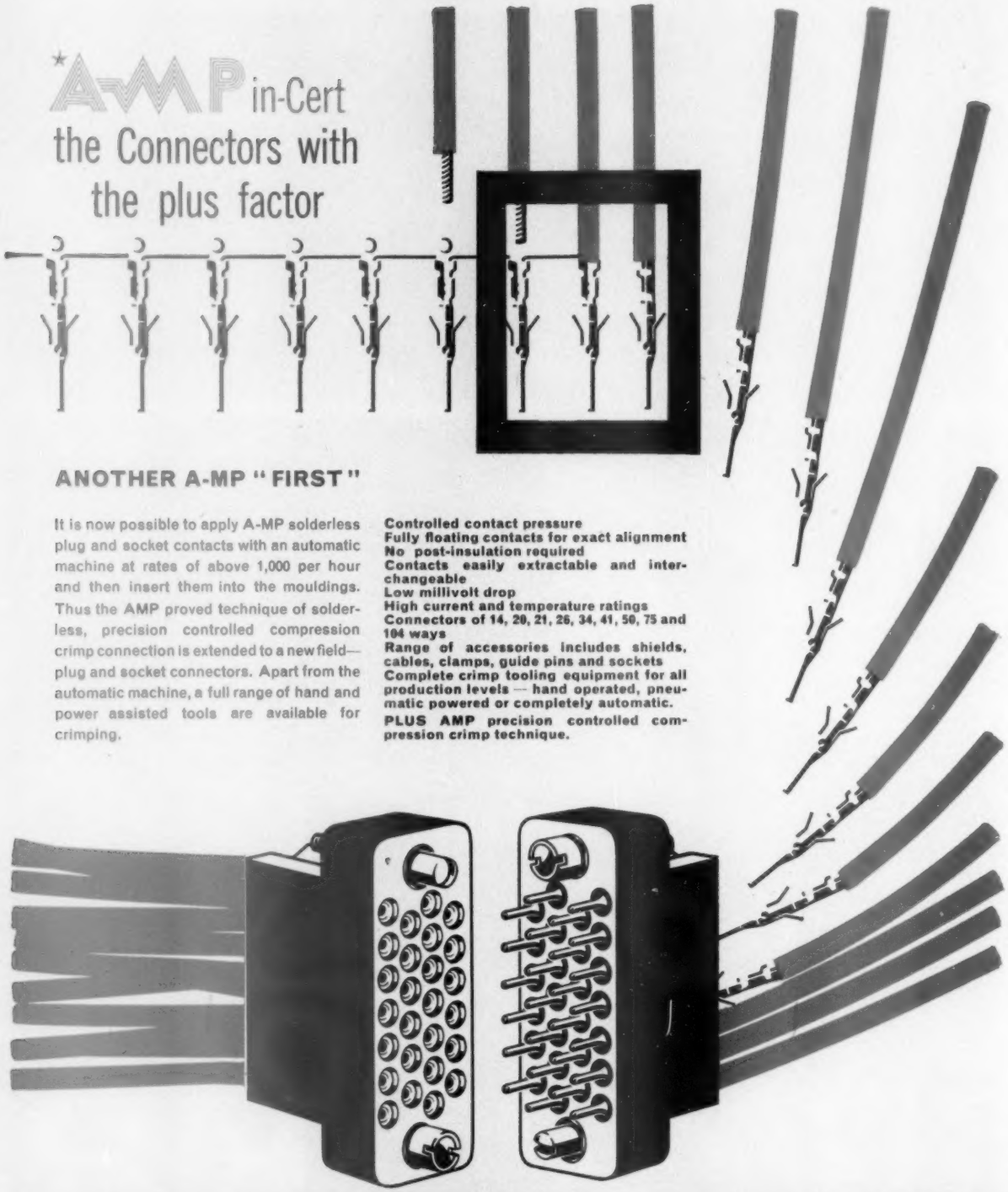

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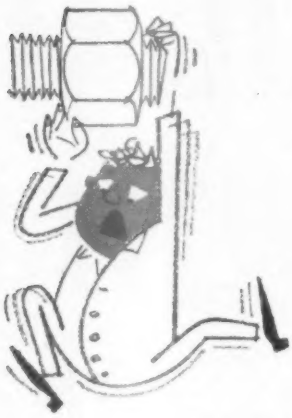


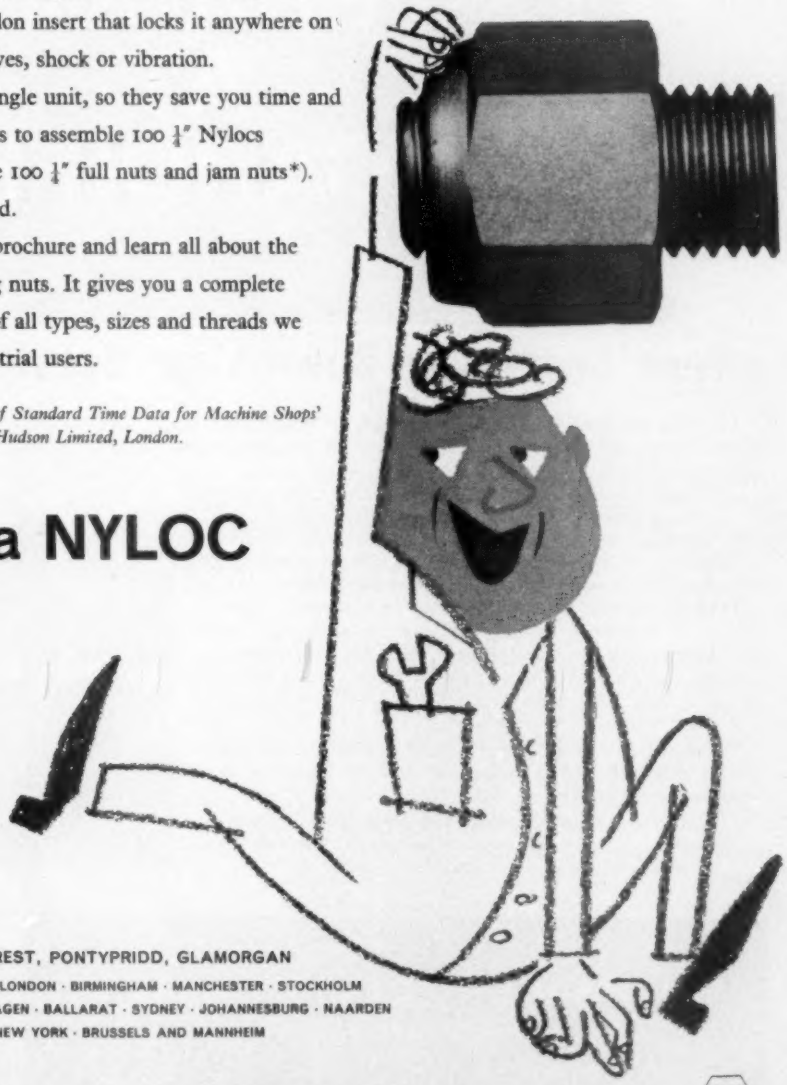
. . . when everything depends on a nut

Some nuts do a tougher job than others and carry a bigger load of responsibility. When you describe a nut that way you practically specify a Nyloc—the self-locking nut with the resilient nylon insert that locks it anywhere on the thread, come oil, water, corrosives, shock or vibration.

Nylocs are complete in one single unit, so they save you time and money on assembly (it takes 40 minutes to assemble 100 $\frac{1}{4}$" Nylocs as against 60 minutes to assemble 100 $\frac{1}{4}$" full nuts and jam nuts*). And they don't damage the bolt thread.

Send right away for the Nyloc brochure and learn all about the whys and wherefores of self-locking nuts. It gives you a complete set of quick reference tables of all types, sizes and threads we turn out for industrial users.

* *These times are based on 'The Handbook of Standard Time Data for Machine Shops' by Haddon & Genger, published by Thames & Hudson Limited, London.*



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offers best ever Bowmaker Service to South Wales

Yet another milestone in the Bowmaker Expansion Programme is reached with the opening of this new Branch at Culverhouse Cross, Cardiff.

Planned to cope with the demand for service to the rapidly growing volume of Caterpillar-built equipment in use on this territory, the Branch consists principally of an extensive service area (18,700 square feet), and a comprehensive parts store (9,500 square feet). Ample space has been provided for substantial stocks of new and used Caterpillar equipment for sale.

The workshops, fully equipped with the most up-to-date facilities, including a twin-headed Link Rebuilding Machine, roller fuse-arc equipment and dynamometer engine-testing apparatus, now constitute one of the finest Tractor repair establishments in the country.

Spare parts stocks up to a value of £100,000 are held and an expansion of Field Service for customers' machines is planned.

All in all, this new Bowmaker Branch represents a notable advance in service to the earthmoving industry in general and to owners of Caterpillar-built equipment in particular.

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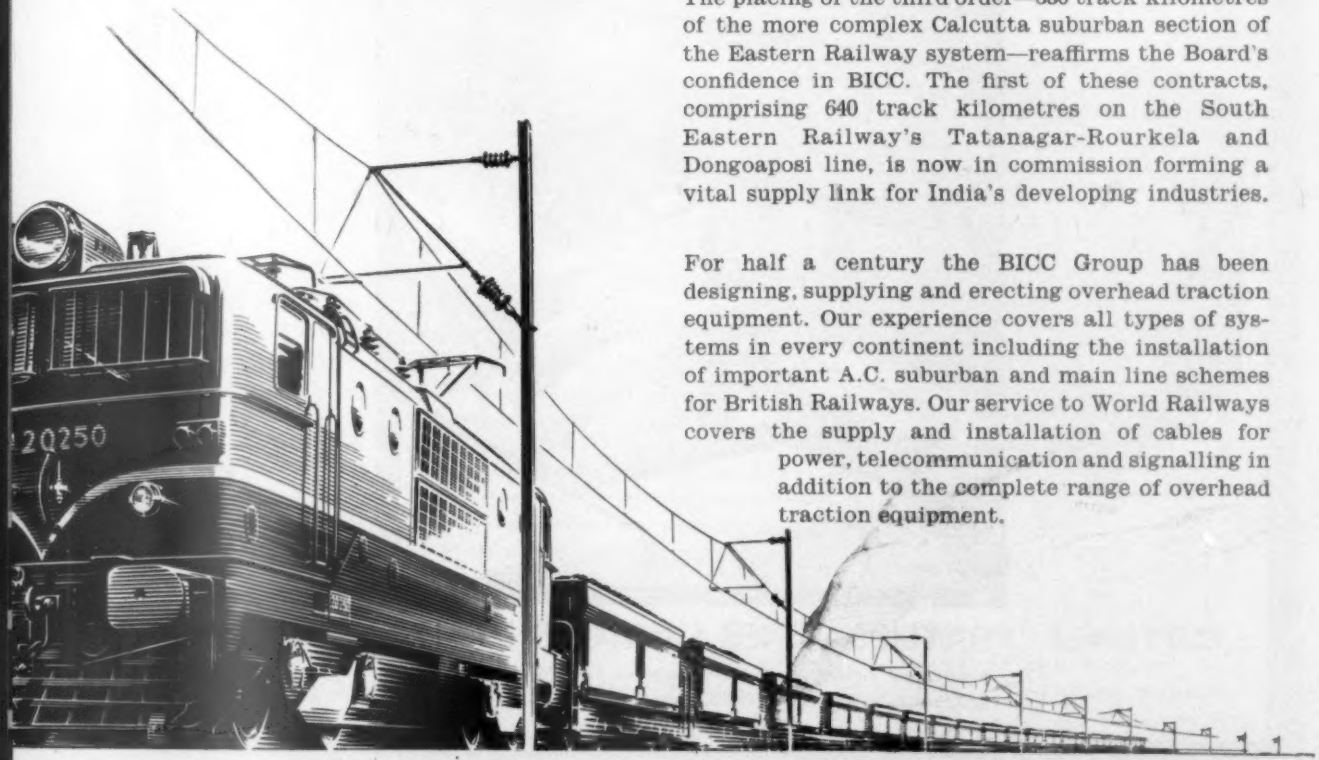
For half a century the BICC Group has been designing, supplying and erecting overhead traction equipment. Our experience covers all types of systems in every continent including the installation of important A.C. suburban and main line schemes for British Railways. Our service to World Railways covers the supply and installation of cables for power, telecommunication and signalling in addition to the complete range of overhead traction equipment.



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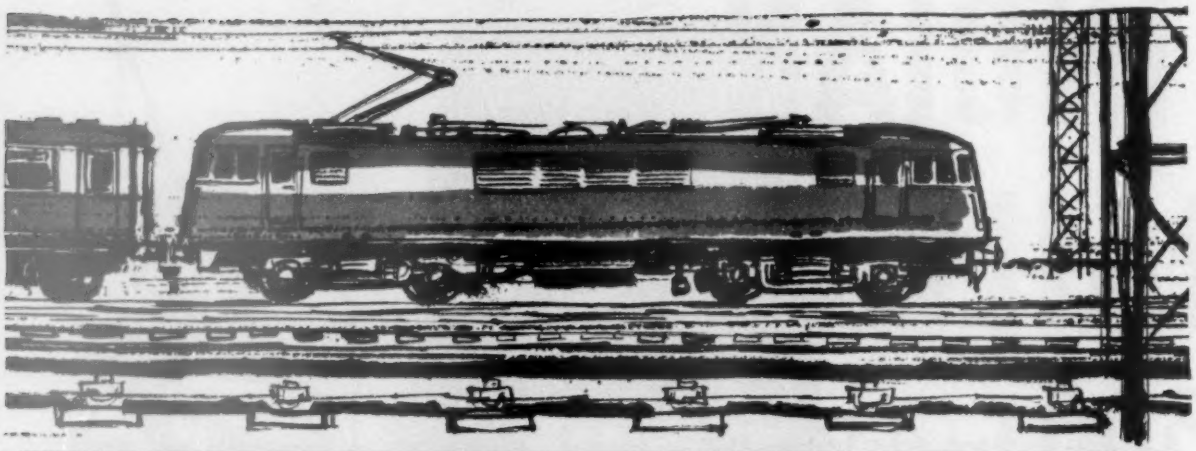
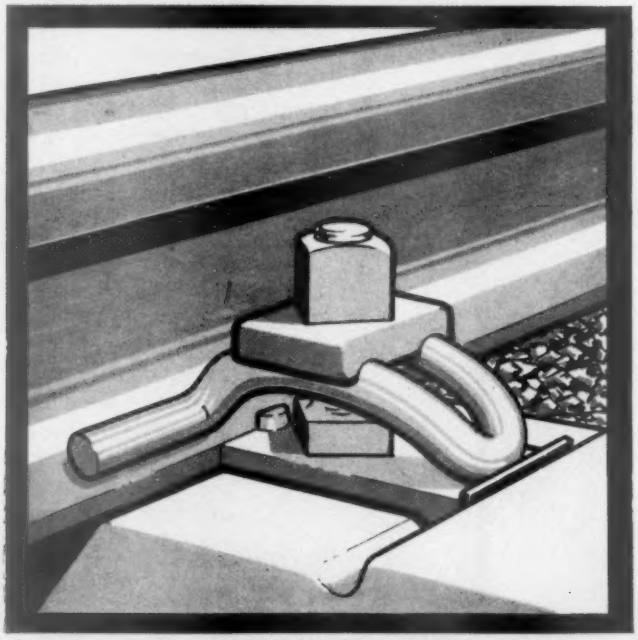


KEEP TRACK

Today's 100 m.p.h. traffic makes big demands on the track. To help cope with this problem, Bayliss, Jones & Bayliss have developed resilient rail fastenings for use with concrete sleepers and long welded rails. Approved by the British Transport Commission, these tough spring steel fastenings are the latest additions to the BJB range, which still includes, of course, many traditional types of fastening.



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Isothermos modern mechanically lubricated axleboxes of the "Athermos" type meet all requirements of modern railways

ISOTHERMOS axleboxes are in the forefront of the technics of railway journal lubrication, having gained THE WORLD SPEED (205 m.p.h.) AND ENDURANCE (405,000 MILES) records when fitted to French National Railways Electric Locomotives.

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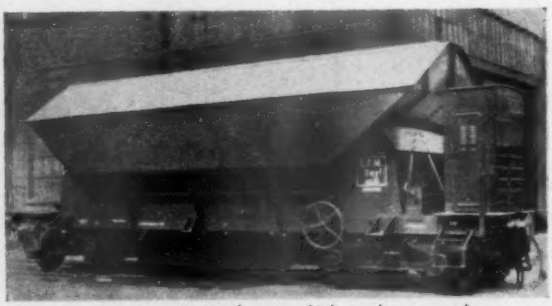
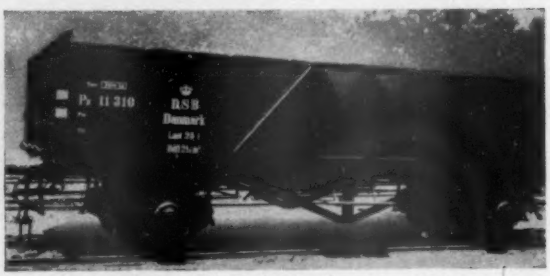
Thousands of Isothermos axleboxes are in daily operation by the main European and African Railway Companies. They are incorporated in the modern wagons of their new development programmes.

Hellenic State Railways



Moroccan Railways (Phosphate ore)

10,000 Spanish State Railways 20-ton wagons



1,500 Danish State Railways wagons

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Photograph of diesel-electric locomotive by courtesy of 'English Electric'.

Matching the efficiency of the new 'English Electric' diesel-electric locomotives is the efficiency of the Far-Air filters which mean less down time, longer service life and greater efficiency under all conditions.
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Cut out photograph shows part of a Far-Air Viscous Panel Filter with expanded metal grille.

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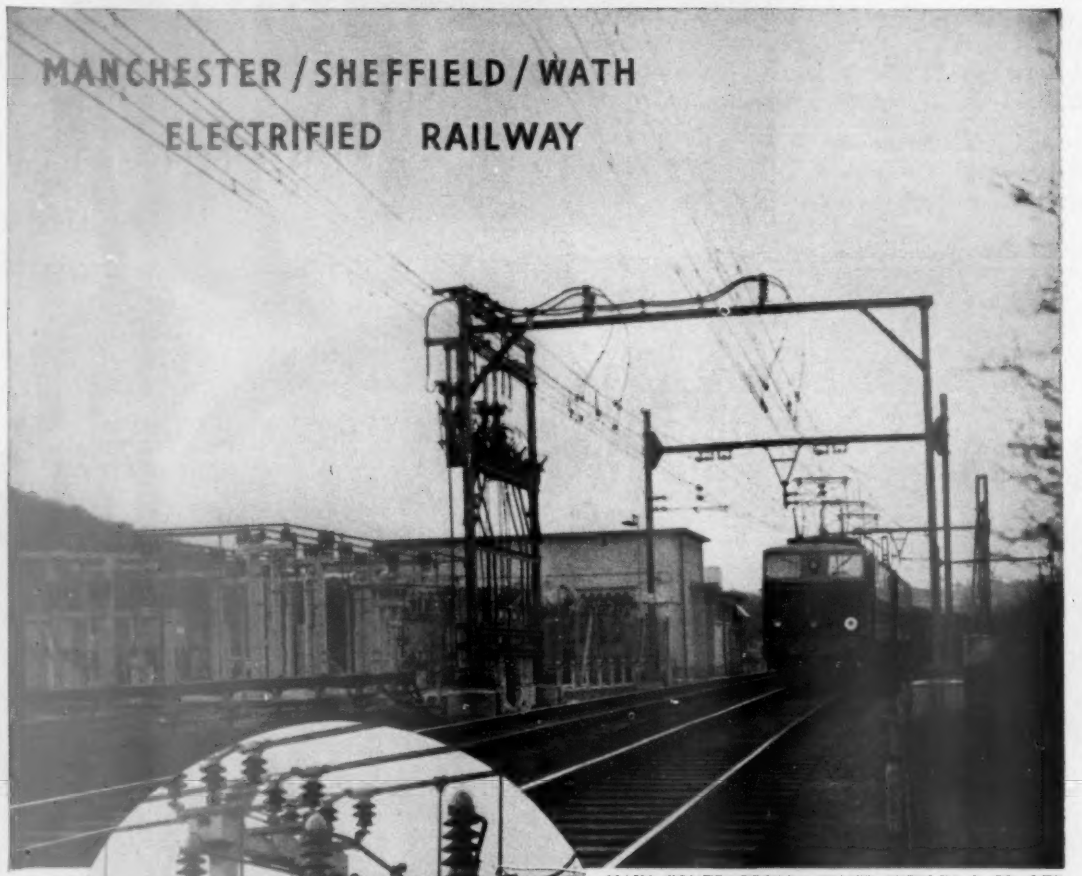
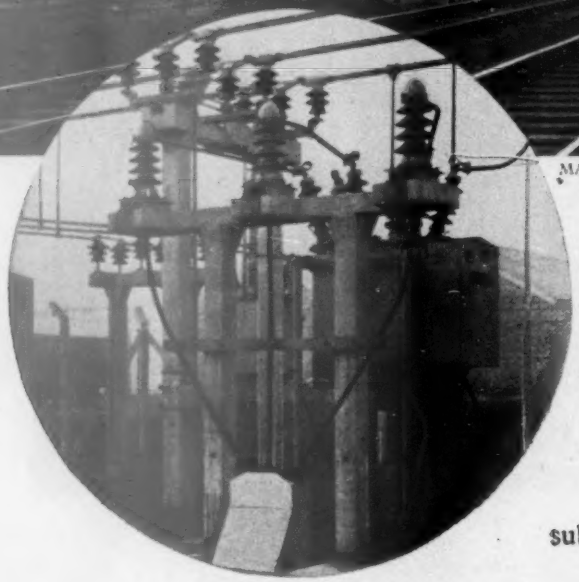


MAIN CONTRACTORS: BRUCE PEEBLES & CO. LTD



The 33-kV 500-MVA circuit-breakers and associated equipment were supplied for all the main distribution substations by REYROLLE

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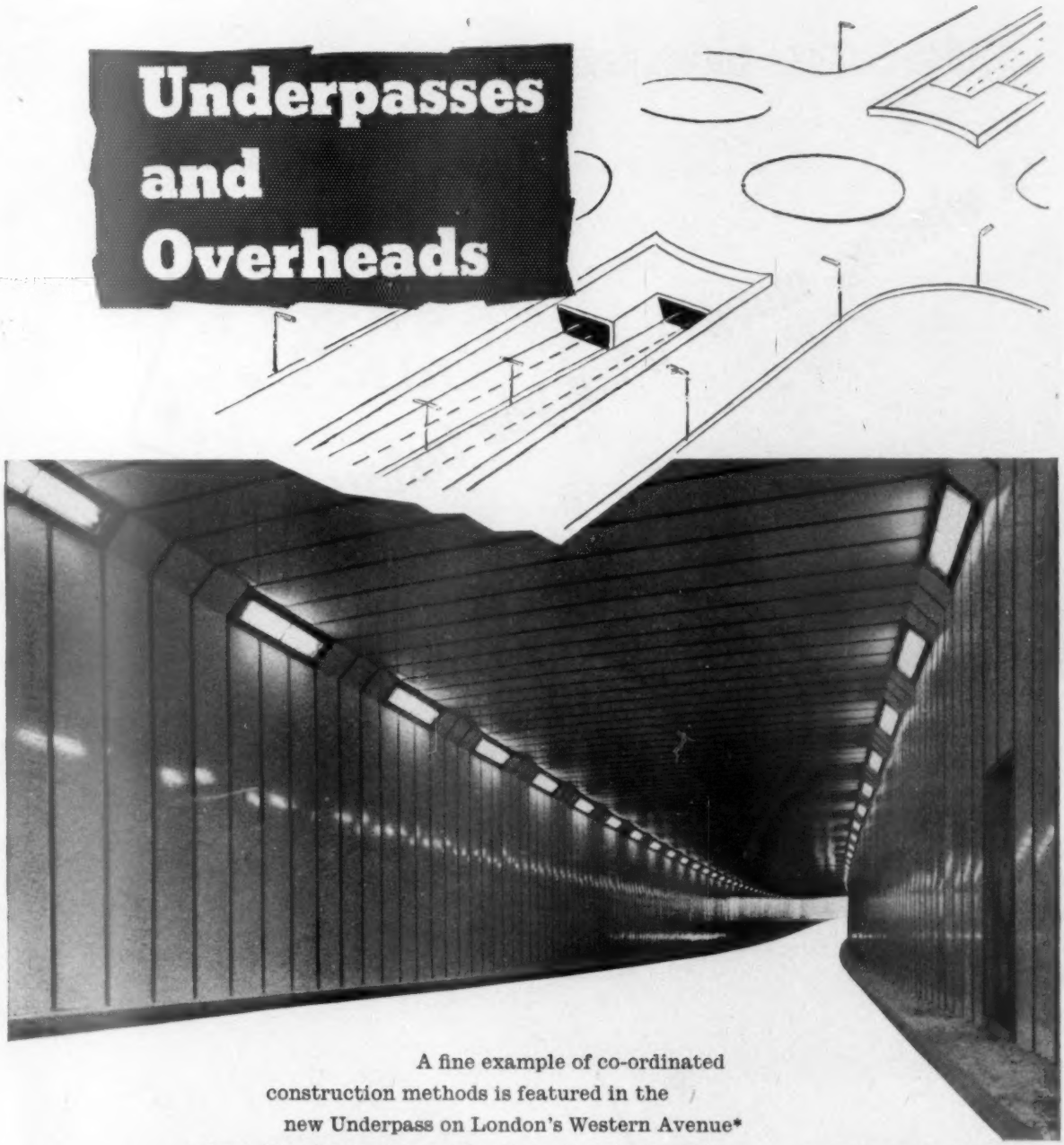
Underpasses and Overheads



A fine example of co-ordinated construction methods is featured in the new Underpass on London's Western Avenue* where Aluminium Alloy extrusions, manufactured by Southern Forge Ltd., are used throughout for framing the interior walls. Strong, durable and light to handle, Alminal Aluminium Alloy provides a versatile and economic material in modern building and road construction.

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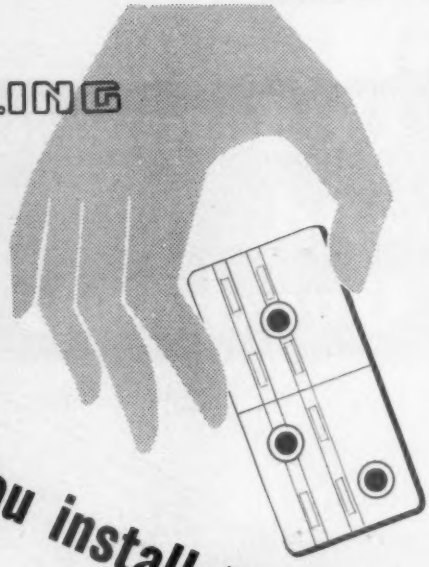

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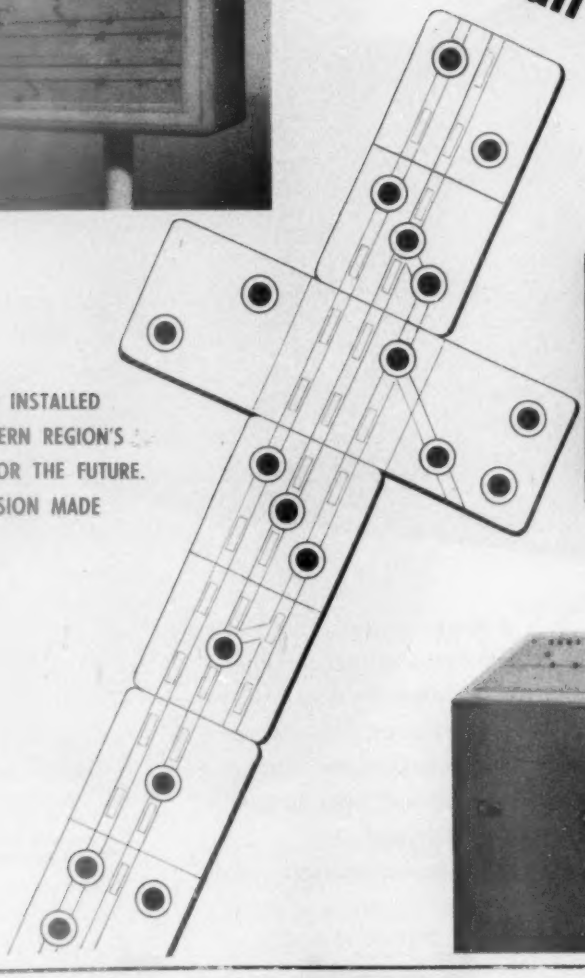

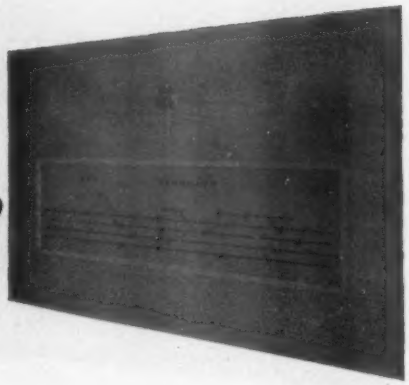

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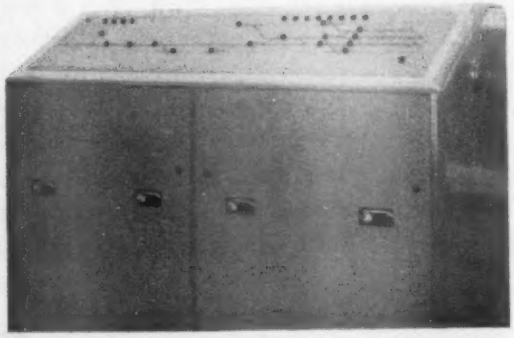

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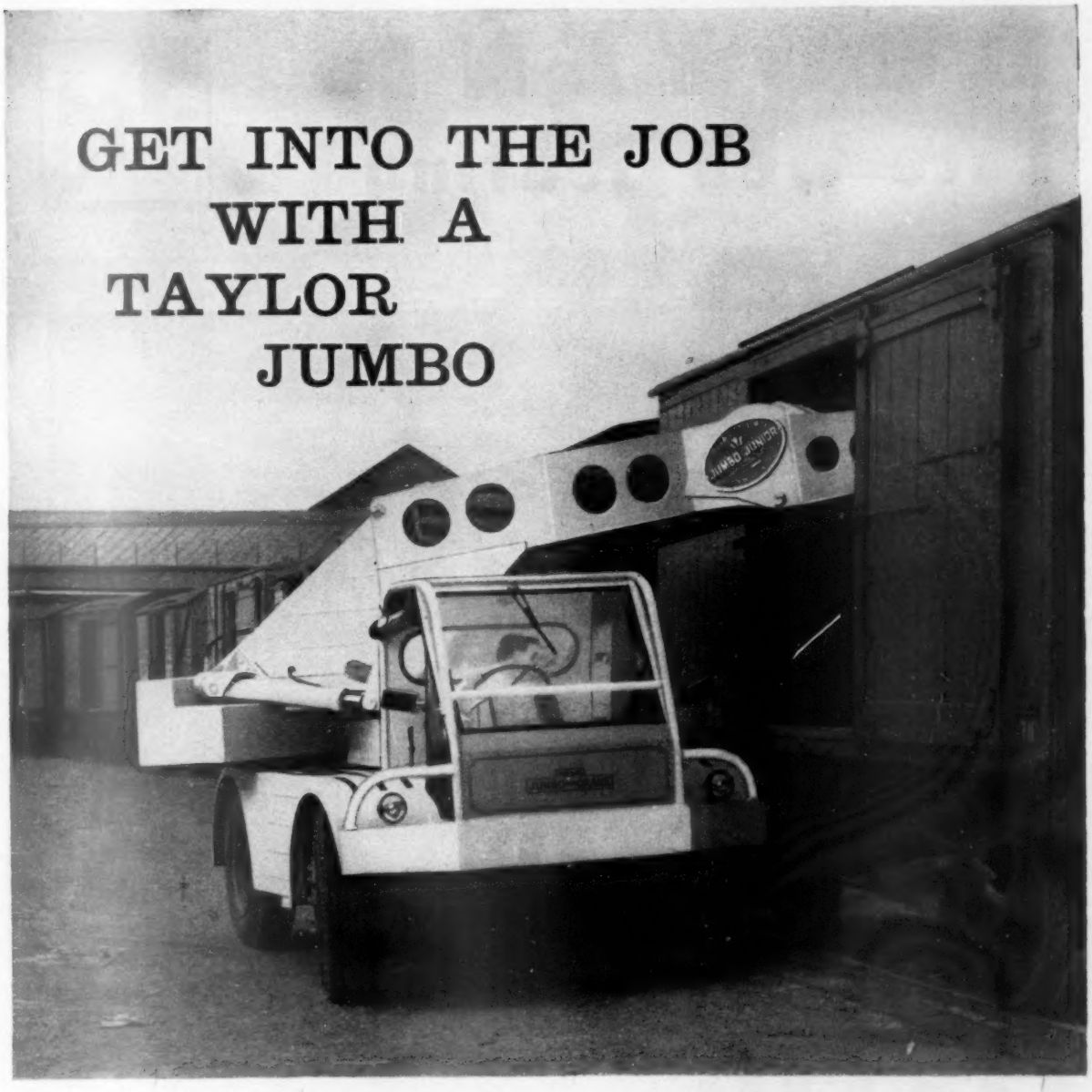

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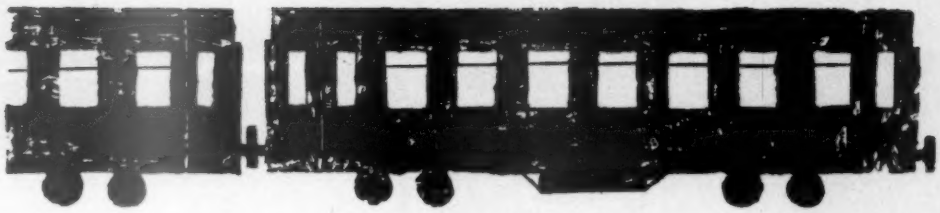
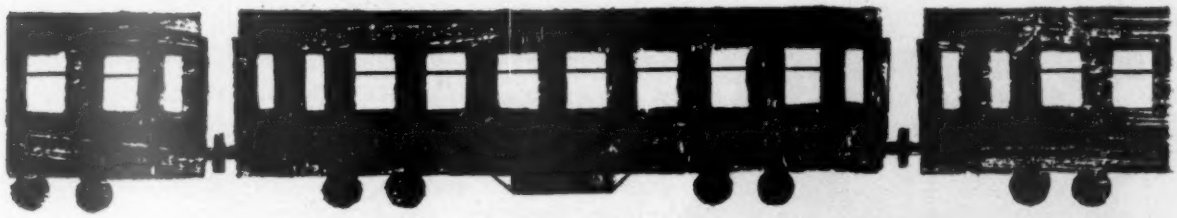
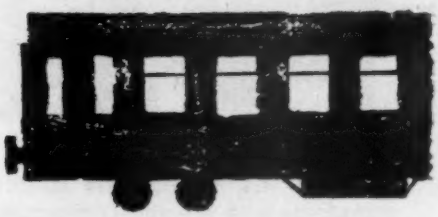


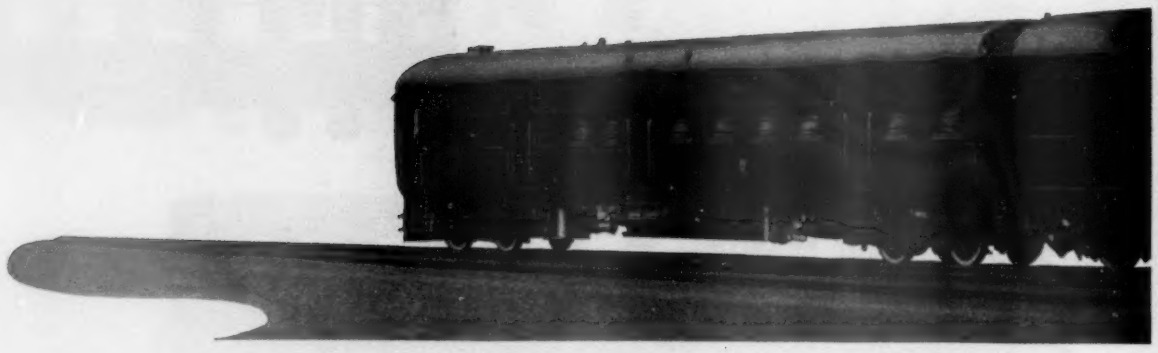
SIGNAL SUCCESS Aluminium in rail transport lessens deadweight and adds payload. It means less maintenance, greater flexibility in structural methods. Imperial Aluminium Company knows all about this. **IMPALCO** aluminium is being used in a very big way for London Transport District Line and Piccadilly Line rolling stock, for British Railways diesel-car units, diesel-electric and diesel-hydraulic locomotives. Strong enough for structural members, light enough for body panelling, durable and versatile, **IMPALCO** aluminium epitomises the transport trends of tomorrow.





impalco aluminium

Imperial Aluminium Company Limited · Birmingham

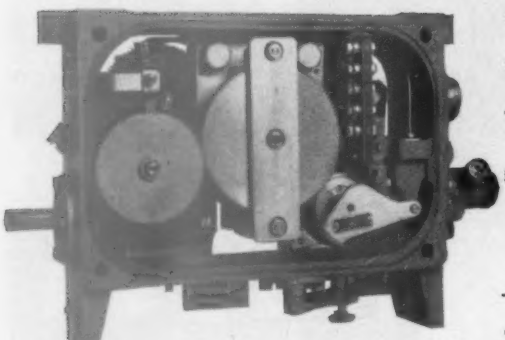


The Nigerian Railway Corporation have recently put into service two of these Twin Unit Diesel Railcars, supplied by the Drewry Car Co. Ltd., and built by Birmingham Railway Carriage & Wagon Co. Ltd. Each unit is fitted with Metcalfe-Oerlikon Patent Safety & Vigilance Control Equipment.

ANOTHER INSTALLATION OF THE

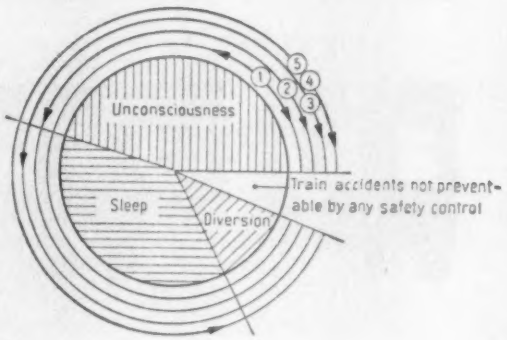
D&M

Automatic Safety &

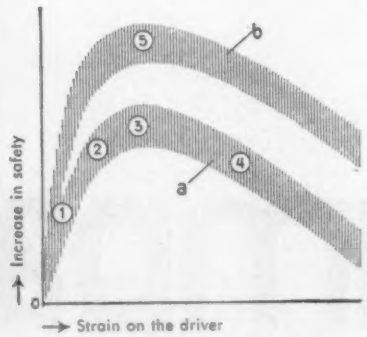


View of the safety side of the apparatus with the covers removed.

1 Normal Deadman's pedal.
2 Encased pedal for instep.
3 Sewing machine type pedal.
4 Pedal which must be periodically released.
5 Normal Deadman's pedal connected with the PATENT SAFETY and VIGILANCE CONTROL SYSTEM.



a Range of existing safety controls with pedals.
b Range of the Metcalfe–Oerlikon safety control.
1-5 Various pedal arrangements as fig. 1.



THESE CHARTS ILLUSTRATE THE SUPERIOR CONDITIONS AND RANGE OF SAFETY OBTAINED FROM THE SAFETY AND VIGILANCE CONTROL SYSTEM.

For full description write for leaflet A.41

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METCALFE-OERLIKON

Vigilance Control System

The Metcalfe-Oerlikon patent Safety and Vigilance Control System is wholly British made and provides a reliable and simple protection against the Driver becoming inattentive or failing to carry out his duties for any reason whatsoever. The equipment operates on a distance cycle and possesses a number of important features and advantages, further the reliability and effectiveness of this system has been well proved in widespread service on railways for more than twelve years.

The Patent Safety and Vigilance Control System is robustly made and embodies the maximum number of safety features in addition to being completely foolproof in operation. It is now fitted to a very large number of locomotives operating under a wide range of service conditions on railways throughout the world.

A particularly important feature is the automatic cancellation of the equipment by the Driver's normal operation of his controls, including the Master Controller, Brake Valves, etc. This arrangement together with operation on a distant cycle relieves the Driver of distraction or additional responsibility whilst at the same time providing the maximum range of safety. The equipment which has proved to be very popular with Drivers is easily fitted to new or existing locomotives and is suitable for use with all types of Brake Equipment.

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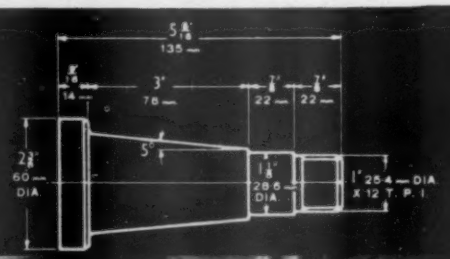

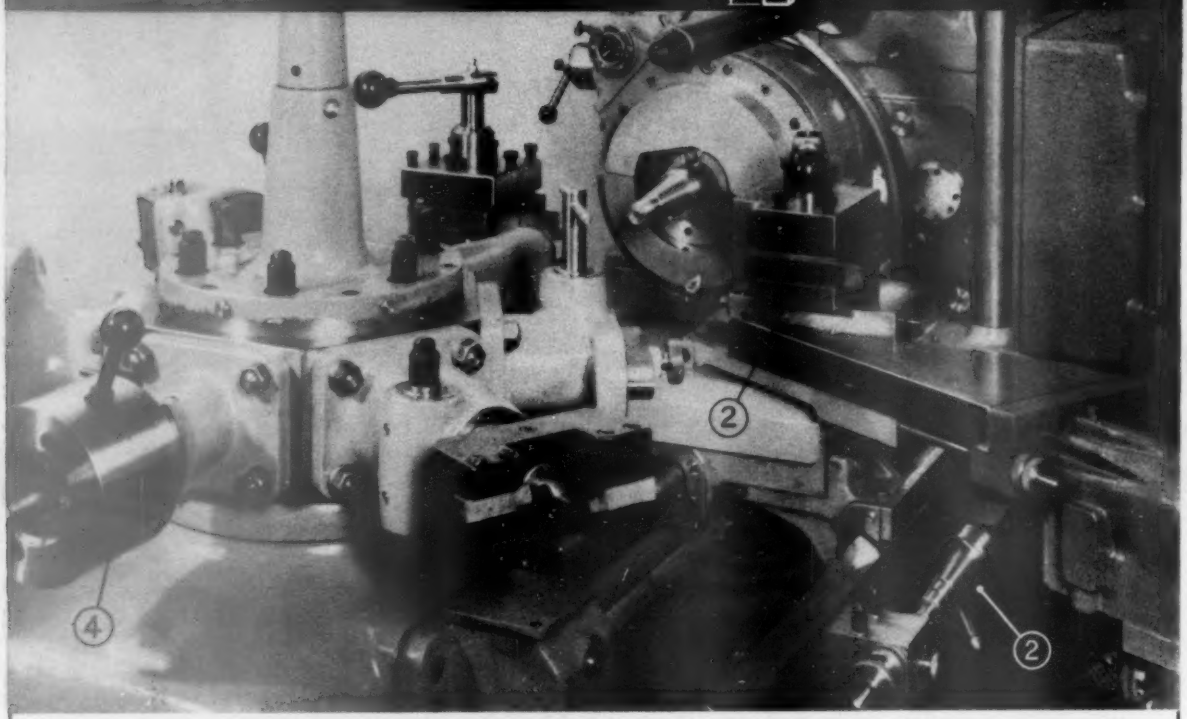

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Fitted with 2½" Air Bar Chuck and Hydraulic Copy Turning Attachment.

Floor to Floor Time : 4 mins. 20 secs.

DESCRIPTION OF OPERATION	Tool Position		Spindle Speed R.P.M.	Max. Cutting Speed		Feed	
	Hex. Turret	Cross-slide		Feet per min.	Metres per min.	Cuts per inch	m/m. per rev.
1. Feed bar to stop, close chuck & centre drill	1	—	1000	—	—	Hand	Hand
2. Support end of bar with live centre	2	—	—	—	—	—	—
Copy turn 1st. cut $\frac{7}{16}$" deep × 4¾" long	—	Rear	1000	654	200	104	·244
" " 2nd. " $\frac{1}{4}$" " × 3¾" "	—	"	1000	392	119	104	·244
" " 3rd. " $\frac{1}{16}$" " × 5⅝" "	—	"	1000	654	200	104	·244
3. Roller end & chamfer	3	—	1000	260	79·5	Hand	Hand
4. Screw with diehead 1" dia. × 12 t.p.i.	4	—	70	18	5·5	—	—
5. Part off	—	Front	1000	654	200	Hand	Hand

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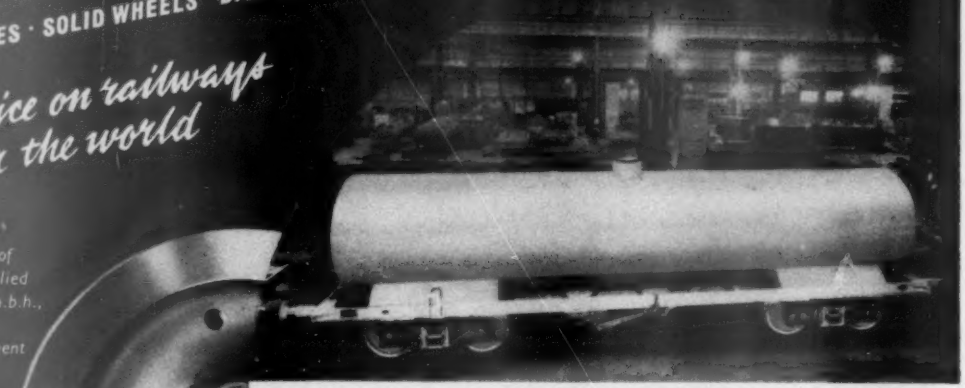
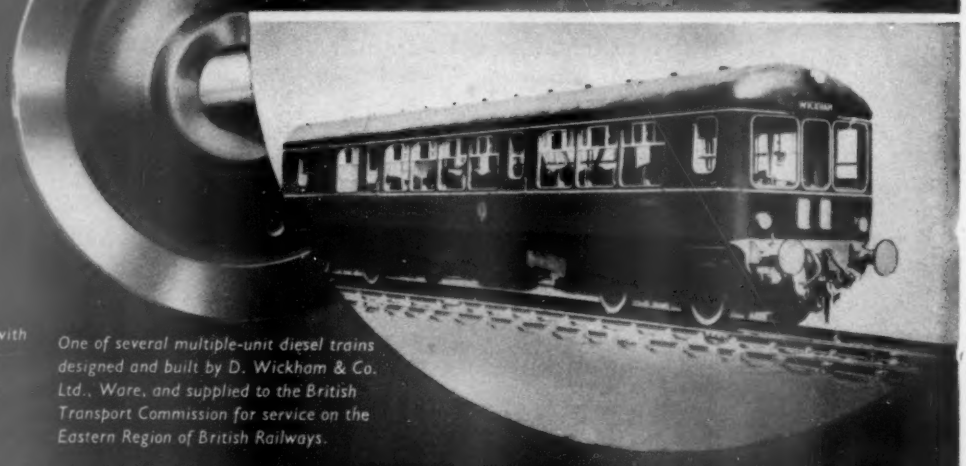


One of a number of tank wagons supplied by Rax-Werk G.m.b.h., Austria, to the Pakistan Government Railways.

B B



All the vehicles shown are fitted with Baker-Bessemer wheels and axles.

One of several multiple-unit diesel trains designed and built by D. Wickham & Co. Ltd., Ware, and supplied to the British Transport Commission for service on the Eastern Region of British Railways.

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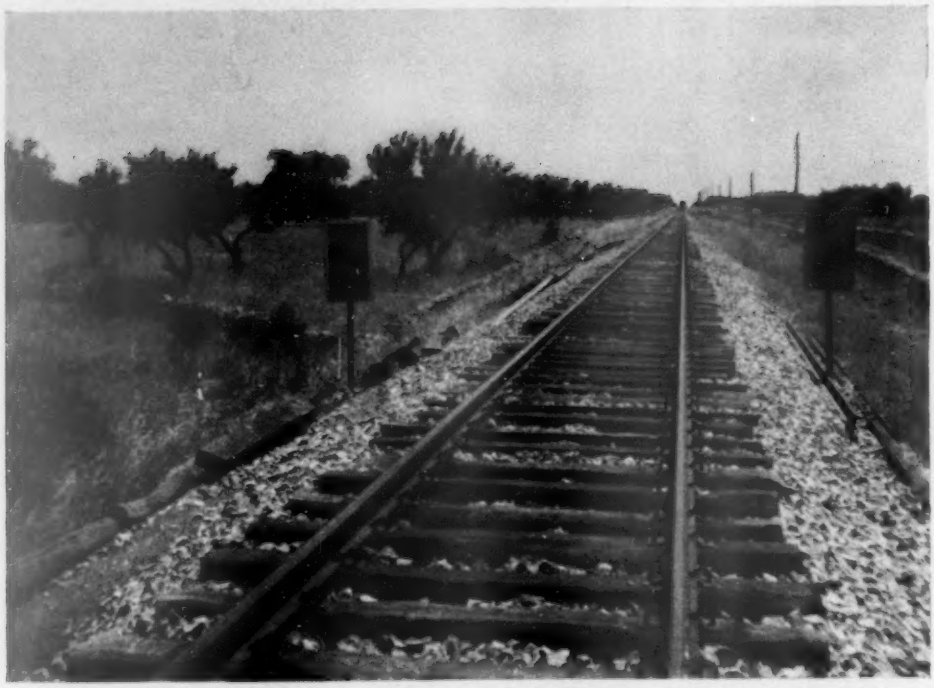

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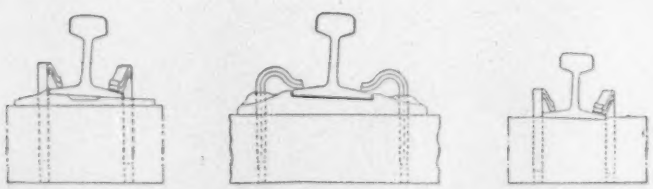

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A journal of Management, Engineering and Operation

VOL 115 FRIDAY SEPTEMBER 29 1961 No. 13

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Loans for rail transport

THE International Bank for Reconstruction & Development has completed its fifteenth year of operations, and during the twelve months to the end of June last its activities were part of a broadening stream of financial and technical assistance to the less developed countries. New lending during that fiscal year totalled $609,890,000. More than two-thirds of the Bank's lending is for basic investment in transport and electric power. In the past few years loans for transport have been drawing ahead, and this trend was markedly in evidence during the last period, with transport loans accounting for $311 million. Railway improvements made up the bulk of this total and included two large loans, one of $70 million to India and one of $80 million to Japan, for the overall improvement and expansion of the rail services of these countries. Details of these programmes have been given at some length in these pages. Other railway borrowers were Burma, Colombia and Thailand. The Burma loan of $14 million will finance the foreign exchange costs of a four-year programme to increase motive power, shorten turn-round time of wagons, and increase passenger capacity. Equipment to be purchased abroad will include new diesel-electric locomotives, diesel railcar and railbus sets for suburban traffic, mechanical signalling and workshop equipment and underframes for coaches and wagons, for which the bodies were to be built in Burma. In addition, some sections of track are to be relaid with heavier rail, and bridges are to be strengthened to take heavier and faster trains. The Colombia loan is for $5·4 million and is to assist in equipping the new Atlantic railroad. The project involves the construction of 425 miles of new road and the rehabilitation of a further 60 miles of track. It will finance the purchase of 16 diesel locomotives, about 300 wagons, shop equipment, and parts to repair passenger coaches and wagons. For Thailand, the railway loan is of $22 million and a six-year modernisation programme is in process to increase line capacity and improve operating efficiency. About 65 main-line and shunting diesel locomotives and about 1,650 wagons will be bought. Improvements are also to be made to track, station yards, signalling and telecommunications equipment and repair shops.

Resumption of Scottish Region electric services

THE electric service on the Scottish Region of British Railways, which ran only six weeks before being withdrawn on December 18 last year, is to be restored with a full weekday service on Sunday, October 1. All possible measures have been taken to overcome the previous difficulties and the precaution of running a full weekday schedule on the Sunday before the normal weekday service starts seems to be wise. The ordinary Sunday service will be resumed on October 8. Extensive trial running has preceded the decision to return to electric traction, which has the full agreement of the electrical engineering consultants to the British Transport Commission and Associated Electrical Industries Limited. Technical adjustments made to the trains have been examined by Brigadier C. A. Langley, Chief Inspecting Officer of Railways, in connection with the report he is making to the Minister of Transport on the events which led to the withdrawal of the service. The electrification programme for the routes on the south side of the Clyde is proceeding and it is expected that it will be brought into operation according to schedule.

The Institute of Transport

THE Institute of Transport meeting to inaugurate the 1961-62 session is to be held at 66, Portland Place, on October 9, and Mr. James Amos will deliver his Presidential address. The 1960-61 awards announced by the Institute, and published in detail in our news pages this week, will also be presented at the meeting by Mr. K. W. C. Grand, the President for the last session. Among the papers to be presented during the next 12 months are, "Investment in road and rail transport," by Mr. D. L. Munby, Reader in the Economics and Organisation of Transport, Oxford University, and "The Western Region of British Railways as an economic unit," by Mr. L. W. Ibbotson, Assistant

General Manager (Traffic), British Railways, Western Region. On October 30, a symposium has been arranged by the Metropolitan Section, the subject of which will be "Dangerous and difficult cargoes by road, rail, and sea." Mr. F. D. Pattisson will be the author of the paper on the rail transport of such consignments. The 1962 congress has been arranged in Cardiff from May 29 to June 1, and the annual dinner at the Dorchester Hotel, on March 16.

A personal message from Mr. Margetts

MR. F. C. MARGETTS, recently appointed General Manager of the North Eastern Region, in a personal message to the staff of the Region in the North Eastern News, said that in a fiercely competitive age time was not on the side of the railways. What was needed now was effort all the time to bring about the physical changes evident in the modernisation programme and in completed projects and those in progress. He said that ideas and determination need not wait on physical assets. Mr. Margetts thought that the changes taking place on the Region incorporating new methods, new machines, new ideas, and a new outlook, matched with a determination to give the railway's customers the sort of service they sought, were all needed if the railways were to go forward with confidence and success. The North Eastern Region had a great tradition of service, and a large number of the staff, like himself, had commenced their railway service in the Region. It was his belief, therefore, that the tradition would be preserved.

Research H.Q. at Derby

WORK is about to commence on the buildings for British Railways £1¼ million engineering laboratories and Research Department Headquarters at Derby. Some details of this project, which will take about two years to complete, have just been released. It is part of a comprehensive scheme to reorganise and expand the railways Research Department which began with the completion last year of the chemical laboratories at Muswell Hill, London. Under the scheme the engineering, vehicle and track-testing, metallurgy and physics divisions will be combined and housed in these buildings. They will also become the headquarters of British Railways' Director of Research, whose office is at present situated in London. The site is on the north side of London Road, Derby, opposite the existing laboratories built by the former London Midland & Scottish Railway in 1931. The buildings will be set back some distance from the road to allow for any future widening scheme. A more detailed description will be found on page 376 of this issue.

Efficient use of freight rolling stock

A VEXED question for the railways at this time of the year, when householders again begin to light their fires and industry to heat its premises, is the efficient utilisation of wagons. The Eastern Region of British Railways recently held a one-day conference at Ilford training school to co-ordinate ideas to achieve greater efficiency from its wagon fleet, not only by speedier wagon movement but by a reduction in the time taken to turn vehicles round at terminals. The Chairman was Mr. D. Fenton, Movement Officer, Liverpool Street, and opening papers were presented by Mr. T. R. Barron, Movement Assistant to the Line Traffic Manager (Great Eastern), and Mr. S. Lea of the Chief Civil Engineer's Department. The conference divided into four groups for detailed discussion, and during the afternoon the ideas produced were summarised by the spokesman for each group: Mr. R. Lawrence, District Operating Superintendent, Doncaster; Mr. D. J. Corbett, Freight Assistant, Traffic Manager's Office, Liverpool Street; Mr. R. F. Graveson, District Commercial Officer, Cambridge, and Mr. E. H. Hopwood, Chief Movement Clerk & Chief Controller, London Tilbury & Southend Line. The afternoon session was attended by Mr. A. A. Harrison, Assistant General Manager, Eastern Region.

An unremunerative line and station

AT A meeting on September 12, the Central Transport Consultative Committee dealt with proposals to close the line from Rugby (Midland) to Leicester (London Road) and also Burnley (Manchester Road) Station. The Rugby to Leicester route is served by two lines, the other being that of the former Great Central Railway. Although the Midland line is the busier of the two, it has not been found possible to make it remunerative, even after dieselisation, and it is thought that further economies in operation are not likely to make it so. The Commission has estimated that an annual saving of some £44,000, not including a further sum of £165,000 for repairs and renewals over the next five years, would be saved by the closure of this line. The Central Committee has supported the recommendation of the East Midland Area Transport Users' Consultative Committee that the proposal be approved. Approval was also given to the proposal to close Burnley (Manchester Road) Station. This has been forsaken by travellers in favour of very good bus services in the area. An expenditure of some £5,000 for urgent repairs would be saved on closure.

Construction in Nigeria

THE administration of the Nigerian Railway Corporation and its consulting engineers, Messrs. Rendel, Palmer & Tritton of Westminster, are to be congratulated on the excellent brochure they have produced, descriptive of the Bornu extension of that railway and its construction. Such a well-prepared and illustrated booklet is particularly welcome as it gives at once a clear picture of undertaking with maps of both the whole Nigerian system and of the extension accompanied by a gradient profile. There is just sufficient descriptive text reinforced by photographic reproductions of the work in progress and of some of the principal bridges. The whole brochure should commend itself to other railway administrations and suggest that they should follow this excellent Nigerian example and prepare similar descriptive works whenever they complete new lines, bridges, or other important works. Elsewhere in this issue is an illustrated article describing the construction of the extension.

Railway in Swaziland

THE decision to build a railway in Swaziland is a demonstration of the importance that the Government attaches to the trusteeship of territories in Africa. The railway will run for about 140 miles, from Ngwenya in the east to the Mozambique border in the west. The Portuguese Government has agreed to extend its existing railway from Goba to the frontier, a distance of about six miles, and to extend the port facilities at Lourenco Marques, to which the railway will run. The money for the project will be provided by loans from the Colonial Development Corporation and the Anglo-American Corporation of South Africa Limited. The railway, in providing an economical outlet for the rich iron-ore deposits at Ngwenya, will go a long way to improve the economic position of Swaziland. Other mineral resources, which could be a source of potential traffic on the railway, are anthracite and coking coal. The line is expected to be open for traffic in 1964.

Antofagasta (Chile) & Bolivia Railway Co. Ltd.

THE difficulties of the Antofagasta (Chili) & Bolivia Railway Co. Ltd. continued during 1960. The Chairman, Mr. H. C. Drayton, has reported to stockholders that operating results in Chile were satisfactory considering economic conditions in South America. After transferring £12,052 to the equipment fund, there were net receipts from the Antofagasta company's

railways, moles and waterworks, before deducting debenture interest of £110,448, of £209,027. After bringing in extraneous income of £167,021 and deducting the loss on the Aguas Blancas Railway, appropriations, and the dividend on the 5 per cent preference stock, there remained £185,627, which with £523,105 brought forward, gave a credit balance of £708,732. The dividend of 3 per cent, less tax, on the ordinary stock, leaves £590,850 to be carried forward.

Should engineers be literate!

WRITING in the current issue of his company's house journal, Mr. C. A. Chayne, Vice-President in Charge of Engineering Staff, General Motors Corporation, states that the engineer who acquires a proficiency in expressing himself is best equipped for outstanding job performance and opportunities for advancement. Observing that it seems hardly necessary to stress the importance of proficiency in the writing and speaking skills, Mr. Chayne commented that educators report many engineering students to have only indifferent interest in their undergraduate courses in writing and speaking. Some resent the "bother;" some dislike being graded for English; others believe they will not have to do much writing or speaking in engineering work. As far as General Motors is concerned, an engineer must be able to write a report on a test run; write a proposal to obtain management approval of a project; write the technical part of a proposal connected with a formal bid on a Government defence project; and address audiences for the purposes of exchanging technical information and to explain designs and applications.

Locomotive conversion

THE conversion of individual chassis to steam locomotives for use with diesel, gas-turbine, or electric power units is not unknown, but the conversion of a whole series or class of steam chassis is unusual. This is the policy of the Italian State Railways administration in converting Sixty 0-6-0 steam shunting engines into electric units, and it is a policy which may continue. Steam shunters have been used almost exclusively, with rare diesel exceptions, even in steam yards. The new electric shunter is equipped to heat passenger trains electrically before coupling them to a main-line locomotive. It is fitted with a 3,000-V. motor driving a generator supplying current to a single induction traction motor with a continuous rating of 190 kW. Manual control alters the independent excitation of the generator. The centre coupled axle is driven by the traction motor through a gearbox and gearing working in a pump-circulated oil bath, the reduction in the transmission being 1 to 12·4. The design of the conversion enables a diesel unit to be substituted for the primary 3,000-V. motor, without alteration to the rest of the equipment.

Diesel railcars for Turkish State Railways

DELIVERY of 15 diesel railcars for the Turkish State Railways, built by an associate company of Fiat S.p.A. in Milan, will shortly be completed. The first one, tested earlier this month on the Turin-Bardonecchis route with Turkish technicians present, was delivered *via* Yugoslavia and Greece. The railcars have been ordered in five three-car sets of two power cars and one coach. Power is provided by four 203-S supercharged Fiat diesel engines rated at 145 h.p. Each transmission is hydro-mechanical with a fluid coupling and five-speed mechanical gearbox. Total seating capacity of the three units is 199. The overall length is 200 ft. and the weight is 97 metric tons. The bogies have two axles with double suspension; the primary suspension is of coil springs and hydraulic shock absorbers, the second comprises leaf springs. The braking system, with the exception of the compressor which is by the Westinghouse Brake & Signal Co. Ltd., has been produced by Knorr Limited.

The cost of exporting

IN broad terms some of the ways of financing export trade and also the facilities afforded by the Export Credits Guarantee Department have been discussed recently. The next step is to consider the cost of financing exports. Much depends on the length of the credit which has to be extended to the overseas buyer.

The advantages of obtaining insurance from the Export Credits Guarantee Department have already been explained, with illustrative examples of the size of the single once-and-for-all premium which has initially to be paid. Reducing this to an annual charge, it is roughly equivalent to anything from ½ per cent for a short-term insurance extending over six months to somewhere around 2 per cent per annum for a five-year credit. No definite figures can be given, for everything depends on the length of the credit, the kind of transaction, and the Department's assessment of the particular overseas market.

When one comes down to the cost of the actual finance itself, for good or for evil, much depends on the level of Bank Rate. At present it is 7 per cent, but it is to be hoped that it will have been reduced before many months have elapsed.

Take first the simplest form of finance: an overdraft from the exporter's banker. As everyone knows, the normal cost of this is "one above Bank Rate, minimum five." In other words, it cannot fall below 5 per cent, and with Bank Rate at 7 per cent, it is 8 per cent. It varies with Bank Rate, and an exporter who begins by paying 8 per cent today may hope in time to find himself paying less. Big manufacturers especially may be able to obtain special terms. All must remember that the bank's powers to lend are limited by the credit squeeze, that bankers cannot lock up their funds in advance for long periods, and that the more a customer borrows from his bank to finance exports, the less he may be able to borrow for other purposes.

If an exporter finances his business by means of bills of exchange, the cost is slightly different; and it must be remembered that bills are only practicable when payment is due within six months. If the exporter arranges a confirmed London credit, he has to pay an acceptance commission of about 1½ per cent, but his bills ranks as "bank bills," and as such can be discounted at the finest rates. Here again Bank Rate is the dominating factor. At the moment of writing, with Bank Rate at 7 per cent, three months' bank bills can be discounted in the market at 6⅞-13/16 per cent, and six months' bank bills at 6¾-11/16 per cent. If Bank Rate goes either up or down, these rates move accordingly. On the other hand, once an exporter has had his bills discounted, he has got his money, and no future changes in Bank Rate affect him.

Alternatively, for short-term credit an exporter can arrange with a Discount House to finance his business by means of trade bills. The same Bank Rate considerations apply. Trade bills are more expensive. With Bank Rate at 7 per cent, the rates quoted in the London market are 7½-8½ per cent for three months' bills, and 8-9 per cent for six months' bills.

When we come to medium-term finance, with payment by the buyer spread over five to seven years, a different set of considerations applies. If we assume that arrangements are made through a merchant banker for the business to be financed by a syndicate of bankers, the first payment to be made by the exporter is a once-and-for-all "commitment commission" of 1 per cent. Then on the money outstanding during the term of the credit which he has received he pays interest at the rate of "one over Bank Rate," i.e., today at 8 per cent., with a minimum rate of 5 per cent if Bank Rate falls low enough. In addition he pays the merchant banker a "management commission" of ⅛ per cent per annum for the term of the credit, to remunerate the merchant banker for his work.

Coming now to long-term credits, spread over ten years or more, there has recently been developed a scheme whereby the business is shared between the British banks and insurance companies. The exporter begins by asking the Export Credits Guarantee Department if a long-term guarantee for the trans-

action is available; and he also takes soundings in the City. He then instructs his overseas customer to get into touch with a London merchant-banking house, whose name the exporter will suggest. This merchant bank forms the necessary banking and insurance syndicate and then offers a loan to the overseas buyer. The terms of the loan are such that the British exporter receives payment as under a cash contract, while the overseas buyer repays the loan on the deferred terms which he was seeking. Whenever the loan is drawn upon for payments to the exporter, the overseas buyer gives the consortium leader interest-bearing promissory notes for the amounts so drawn, and these notes mature according to the terms of the loan contract. The banks take up the earlier notes falling due within a period extending up to five or seven years. The insurance companies take up the later notes, extending up to ten or 12 years.

The cost to the exporter is naturally higher than it would be for short-term or medium-term credits. He will probably have to pay an initial once-and-for-all commitment commission of ½ or 1 per cent. His interest charge is now 7½ per cent per annum. This is fixed for the whole period, regardless of any intervening changes in Bank Rate. He will also have to pay a management commission of ⅛ per cent per annum.

Here is a rough picture of the cost of financing export trade. How it is shared between buyer and seller is a matter for individual bargaining, and the intensity of foreign competition is present in every British exporter's mind. Whether it could be reduced is a matter which was discussed in an earlier article. All that can be said now is that the world of finance renders an essential service, and like everyone else it has to live. Two things can be said to every would-be exporter. First, begin by going to your bank manager, put all your cards on the table, discuss with him the various possiblities, and get his advice and co-operation. Second, do not grudge the cost of insuring with the Export Credits Guarantee Department. It may make all the difference.

The future of urban public transport

THAT despite the continuous growth in private motoring there is a swing back to thinking in terms of public transport, by urban planners and transport experts, as a means of stemming uncontrolled urban spread and the deterioration of city centres, was noticeable during the discussions at the World Traffic Engineering Conference at Washington at the end of last month. This was particularly so during the debate on "Urban Transportation and its Future," which was marked by a startling similarity of view on the problem and of the approach to its solution by spokesmen from the 30 countries represented.

Commuting travel was everywhere described as being heavily dependent on public transport: in New York 90 per cent and in London 94 per cent of peak travel was accounted for by the commuting railways, underground, and bus lines. In German cities, public transport was said to carry two-thirds to three-quarters of the commuter traffic. The same story was told for Zurich and Rio de Janiero. Consensus of opinion was that the motor car although expected to cater for an increasing proportion of the total traffic, could not cope with the daily journey to and from work, and consequently all approaches to the solution of the problem must start from the fact that private and public transport should be regarded as inter-related, since only a logical co-ordination of the two would enable the problem to be overcome. For public transport to hold its share, it was necessary for it to improve its services and facilities, and ensure that they were adjusted to meet the changing demands arising from urban spread. This meant that the planning of land use and of transport must march together. Thus it was reported that in drawing the long-term development plans for Washington, Los Angeles, San Francisco, and other American cities full consideration had been given to the provision of new rapid-transit lines stretching to the countryside on the periphery of the growing urban conurbations.

It was from Philadelphia that the most remarkable evidence came of how faith in rail transport, if backed by public funds to enable its modernisation, could help preserve the importance of the central business area. In the paper presented on behalf of the city it was stated that, since it was impossible to solve the problem with highways, it had been accepted that rail rapid transit would continue to play a significant role in the future. Towards this end, express services had been installed on the chief subway line at a cost to the city of $5 million, 270 new subway cars costing $25 million were being put into use, and for the first time for years, 1960 had shown an increase in passenger journeys on the subway and elevated system.

More remarkable was the result of the effort to save the faltering railway-commuter service on which patronage had been sharply declining. Philadelphia's bold experiment was succeeding. Aware that to try and meet the losses the railways would continue to reduce services and increase fares the city stepped in. As the prepared paper stated: "We believed we could reverse this trend by the simple expedient of increasing service and lowering fares, and we contracted with the two railroads on two commuter lines to do just that, with the City of Philadelphia picking up the cost of providing the extra service." A non-profit corporation, the Passenger Service Improvement Corporation, was formed to administer the programme. The city's intervention has met with success. Patronage on the six lines operated by the Corporation has increased by from 35 to 400 per cent. To insure further growth rolling stock was being acquired, stations improved, more parking space provided, and better services operated at reduced fares on all lines.

With this experience behind it, it is not surprising that the Corporation's spokesman, Donald C. Wagner, its Managing Director, concluded: "No one in this area will say the movement of goods and people should all be by highways but the emphasis will be on them for a large part of the job, with rapid rail transit continuing to play a significant role in the total complex with the possibility of some increased emphasis on rail service." He added that no metropolitan area could prosper unless it had a vital healthy heart, or core, which both served and was supported by the whole metropolitan area. In Philadelphia they were convinced that the future of downtown was secure and were consequently investing millions of dollars to back their belief. Much of this investment took the form of transport improvement to enhance the use of land since no transport planning could have any meaning unless it were related to future land use.

The general conclusion was that transport was related to land use, that urban land use patterns were changing, and that the techniques of interrelating land use and transport needs must be developed.

Gathering the new crop

BY tradition the presidential address to the Institution of Locomotive Engineers falls partly into the personal experiences of the author and partly into a discourse of one or more of the most important subjects claiming the attention of the locomotive profession at the time. When Mr. J. F. Harrison, Chief Mechanical Engineer of the British Transport Commission, addressed members of the Institution on Tuesday last, it was natural that he should devote a good deal of the earlier part of his address to some of the outstanding steam locomotives which had come into operation, and which served so well, during the last 40 years. It was natural, too, that he should pay an especial tribute to the late Sir Nigel Gresley, and pertinent to draw attention to the fact that for some 105 years the Great Northern and London & North Eastern Railways had only four locomotive engineers, which made possible continuance of a single policy for periods of up to 25 years, as also was the case on the Great Western Railway. The effects of this continuity in both cases were marked by the production of outstanding locomotives.

When the British Transport Commission announced its modernisation plan in 1954, the steam locomotive fleet was 18,420 and the overall availability was as high as 86 per cent. Mr. Harrison showed a slide giving the mid-1961 rolling-stock position compared with 1954, which demonstrated the change-over which has occurred since that time:—

Summary of rolling stock

	End of 1954	Mid-1961
Locomotives		
Steam	18,420	12,676
Diesel	316	2,822
Electric	71	147
Coaching stock		
Locomotive hauled	53,062	44,195
Diesel multiple-unit	70	3,978
Electric multiple-unit	4,632	6,743
Wagon stock		
Total	1,124,710	960,446
Fitted or piped	179,788	322,511

By mid-1961 diesel-operated coaching mileage had already caught up with that operated by steam, due, in the main, to the very large number of diesel-mechanical hydraulic and electric multi-unit railcar units which had been introduced. These consisted of some 2,400 motor-coaches and 1,600 trailer-coaches. These had played a large part in maintaining the overall level of passenger traffic, despite the withdrawal of various unremunerative services. The total of passenger journeys, in fact, had increased slightly from 1,020,000,000 in 1954 to 1,037,000,000 in 1960, coupled with a slight rise in the average length of journey.

The earlier railcar units had their teething troubles, largely because the mechanical and electrical control equipment of the diesel-mechanical cars was based on road-vehicle practice, and as such had not been subjected to the vibration and rough-and-tumble work of a vehicle with steel wheels running on steel rails. At present the engines of these railcars are running 90 to 100,000 miles between top overhauls and 180,000 to 200,000 miles between general overhauls.

The improvement to passenger traffic resulting from modernised services is shown in the following table:—

	Passenger journeys (excluding season tickets)	Percentage increase
Electrified services		
E. Region		
Shenfield to Southend & Chelmsford		
Steam service. Final year	2,612,602	—
Electric service. Year ended 31.12.58	5,420,335	107
Electric service. Year ended 31.12.59	5,913,369	126
S. Region		
Kent Coast extension		
Steam service. Final year	7,561,278	—
Electric service. Year ended 30.6.60	9,502,825*	26*
Electric service. Half-year ended 31.12.60	—	32*
* Relates only to originating bookings in newly electrified areas.		
Diesel multiple-unit services		
N.E. Region		
Leeds to Barnsley		
Steam service. Final year	204,154	—
Diesel service. Year ended 31.3.59	740,531	263
Diesel service. Year ended 31.3.60	707,000	246
L.M. Region		
St. Pancras to Bedford		
Steam service. Final year	5,750,971	—
Diesel service. Year ended 31.1.61	6,459,714	12

As Mr. Harrison truly remarked, the excellent results obtained from this change from steam to diesel operation for rural, urban and some suburban services, have not received the publicity they deserve, possibly because, as a nation, the public is not conscious of the things that go well, but only of the far fewer things that go wrong.

The President also dealt at some length with the B.R. B.4 bogie, which was developed and built at Swindon, and which is now giving excellent results, and on reasonable track gives a very good ride index factor of about 2·5. He also described briefly the integrally constructed coach, the design of which was initiated by Mr. A. E. Robson and worked out at Swindon under Mr. R. A. Smeddle's guidance, to the same end-load specification as for the existing coaches but weighing some 2½ tons less than a similar standard vehicle body and frame. This reduction in weight, coupled with the reduction in weight by the use of the simplified new B.R. B.4 bogie, will reduce the total weight of the vehicle weighing say 33 tons, to one weighing 28½ tons, and will enable 12 coaches to be hauled in place of ten by the same locomotive. The integral coach construction isolates the body from the bogie and track sounds, which, coupled with the general improvement in sound insulation, gives a much quieter vehicle without incurring excessive expenditure.

He also gave some interesting figures on comparative performance between steam and diesel locomotives. He said that for similar duties steam locomotives performing express passenger work are averaging 170 miles per calendar day with an average casualty rate of 1 per 17,000 miles, whereas working similar express passenger services, diesel locomotives of comparable power are averaging 300 miles per day with a casualty rate varying according to Region from between 1 in 12,000 and 1 in 22,000 miles. If steam heating failures are eliminated, the diesel locomotives would be averaging a varying casualty rate of 1 per 15,000 to 1 per 26,500 miles a day. The standard Type-1 diesel locomotives, which are not fitted with steam heating boilers and are used on freight transfer and shunting duties with some main-line working, are averaging a casualty rate similar to steam, that is about 1 per 70,000 miles, or 1 casualty per locomotive every 2½-3 years. With each month the casualty figures show an improvement as teething troubles are eliminated. These troubles have been divided into four main equal parts. These are (a) steam-heating boilers; (b) control gear; (c) engine equipment (blowers, pipes and so forth), and (d) miscellaneous.

Mr. Harrison also mentioned the 1,500 h.p./600 h.p. electro-diesel locomotive now in course of construction at Eastleigh under Mr. W. J. A. Sykes' direction. This seems to the author to be a "winner." He could foresee a great future for it, not only on the Southern Region, but also for AC overhead electrified lines. He hoped it would be available in time to meet the obvious need of feeding the main electrified trunk lines and also to provide through freight services during the night hours when current is switched off for maintenance purposes.

Finally, Mr. Harrison said that the general effect of the last seven years of modernising British Railways equipment had resulted in a reduction of maintenance staff, both main works and out-stations, by some 14 per cent, and maintenance expenditure to outside sources by as much as a further 36 per cent. This, coupled with the increase in passenger revenue, clearly showed that the first crop was a good crop, perhaps better than had been expected, and not yet fully fructified. It gave great hope and encouragement to everybody in the business.

Future of U.S.A. passenger services

BY A CORRESPONDENT

AT last the Interstate Commerce Commission has awakened to the need for preserving essential rail passenger services in the United States. After investigating the position of the New Haven, which operates 1,740 miles of road and had a deficit of $12·8 million at June 30, the Commission declared at the end of August that the railroad could not continue to render essential transport service in the absence of direct Federal grants. Its passenger deficit was the primary cause of the line's financial difficulties, though the Commission called for self-help by the railway and State assistance in addition to Federal aid.

Under present conditions the New Haven would be entitled to receive about $7·3 million a year from the Commission's proposed Federal aid scheme, but the total cost of the programme would not exceed $52 million a year, if all U.S.A. railways qualified for help. The Commission reaffirmed its opinions that the 10 per cent excise tax on passenger fares should be repeated and that Federal tax laws should be amended to encourage local and State tax relief.

In putting forward its scheme, the Commission was emphatic in stating that the subsidising of transport is undesirable except when justified by considerations of national defence. It believes that in view of the expanding population of the States, rail communication service will be more widely used ten years from now, so that future needs must be taken into account before rail facilities are lost which could only be reconstructed at a fantastic cost.

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

WITHDRAWAL OF SERVICES IN WALES

September 17

SIR, The news of the intended withdrawal of passenger services from the Eastern and Western valleys of Monmouthshire came as a shock, and has aroused much local opposition. This is probably the largest group of communities so far threatened with deprivation of passenger rail facilities, and the recent introduction of diesel railcars on these lines had created the impression that their future was secure. If unremunerative routes are to be sought, there are plenty of other likely targets within South Wales which one would have expected to be dealt with first.

The apparent failure of these Monmouthshire routes is in contrast to the prosperity of the neighbouring Cardiff valleys lines, and it is perhaps useful to examine the kind of service provided. When travelling in the area recently I was surprised at the amount of time spent by the diesel trains "waiting for time." This impression is confirmed by the timetable; the steam-operated service of 1955-56 comprised 17 daily trains over the Western valleys route from Newport to Brynmawr averaging 83 min. for the 22¼-mile journey with its 16 intermediate stations. With diesel traction a service of 18 trains up the valley is provided, slightly more evenly spaced though not on a regular-interval basis, and these average 84 min. for the journey, still stopping at all stations. In comparison, the 1939 timetable included some semi-fast trains which reduced the average time to 75 min. Today, the competing bus service from Newport to Brynmawr makes the throughout journey in rougly 90 min., so that the train offers only a slight advantage in journey time, and is much inferior in frequency of service.

The rearrangement of the running lines in the Newport area has created a further difficulty for the valley services as the outer face of the Up island platform where they normally terminate is now required to handle many of the Up main-line trains. If valley trains are occupying this platform for their accustomed layover periods, main-line traffic in both directions has to use No. 5 platform (the former Up main), or alternatively Down trains have to cross the stream of freight traffic twice to call at the old Down platform.

If the Monmouthshire valleys passenger services are now in jeopardy, this seems to be due to the fact that diesel traction was merely used to perpetuate the existing type of service, and that no attempt has been made to exploit the new form of traction to provide a better and more efficient service.

Yours faithfully,

J. N. FAULKNER, A.M.INST.T.

53, Westfield Road,
Surbiton, Surrey

RAILWAYS INTO ROADS

September 10

SIR, As I expected, several interesting letters have appeared suggesting how many passengers a single line of railway might be able to carry. I asked for examples of what was being done at present to make sure that if all the railways were converted into motorways, there would be no section of these routes where road transport could not give a better service than the existing railbound transport.

The fact that no one has given examples of a single line carrying more than 10,000 passengers in one hour, never mind 30,000, convinces me that railway conversion is by far the best solution to our traffic crisis.

Railway conversion is a nation-wide project, and as well as providing excellent access to the city centres it will also provide a really comprehensive system of motorways covering the whole country. This will enable industry and population to decentralise on an unprecedented scale, so that industrial organisations will be able to build factories in areas where coal mining is declining as well as in rural districts. This will have the beneficial effect of reducing demand for land in the heavily over-populated Greater London Area, and it may well be that some of the attraction of having an office in London will disappear when motor cars can travel at express train speeds to any part of the country without any need to worry about a timetable.

On the other hand the city centres will be connected by the converted railways with airports, and so airlines will benefit greatly from the much reduced time that the air passengers will spend on the ground travelling between airports and their destinations.

In conclusion I would point out that railway conversion is really only a logical development however distasteful it may seem to the railway enthusiast, and as there are so many duplicated railway lines it will be quite easy to bring about without causing undue disturbance.

Yours faithfully,

A. I. WATKINSON

3, Otley Road,
Harrogate, Yorks

September 18

SIR, The railway conversion discussion appears to be stabilised temporarily at a figure of 30,000 passengers an hour, produced by x vehicles carrying y passengers each. If $x=30$ in the case of rail, but 500 in the case of road, then 17 times as many drivers and conductors will be required, a change that would be contrary to modern business practice and the reverse of advice that would be given by industrial consultants. In modern labour conditions, it might well prove impossible, apart from hazarding the future.

Even in the case of an allegedly under-used line, the Great Central, it has been suggested that 868 motor vehicles should replace 125 trains, a staff ratio in favour of rail of 7: 1. If a conservative figure be taken for the whole country of 10: 1, the number of drivers and conductors required would be 580,000, that is, larger than the present total of British Railways staff, a favourite target for criticism.

The conversion scheme stands condemned on these grounds alone, but certain other points merit discussion. A rush-hour inflow into London of 360,000 passengers has been suggested, requiring 6,000 buses. No consideration appears to have been given to the terminal problem of reversal and outflow of empty vehicles, which would have to be sufficiently expeditious so as not to impede the steady inflow of 500 an hour per lane.

Regarding the alleged 46 unused lanes, it should not be forgotten that superimposed on suburban rush-hour traffic are goods trains, in transit to and from yards just short of passenger terminals. In so far as there may be unused capacity, a considerable easement of the country's economic problems would be obtained by a diversion of suitable traffic from road to rail without any immediate expenditure of capital.

Yours faithfully,

A. W. T. DANIEL

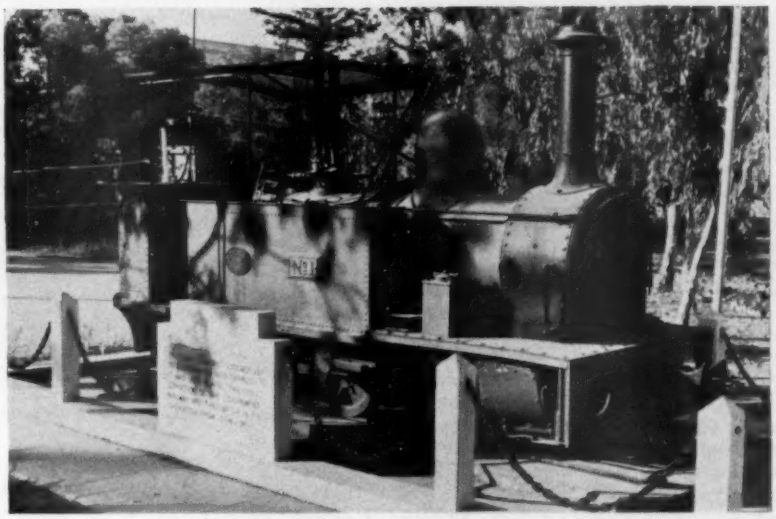
3, Hall Way,
Purley, Surrey

The Scrap Heap

Last train in Cyprus

On December 31, 1951, engine No. 12, drawing a three-coach passenger train pulled into Famagusta Station, Cyprus, and so brought to an end the operation of the Cyprus Government Railway.

This railway, consisting of about 70 miles of 2 ft. 6 in. track, commenced operation in 1904, and had 12 locomotives, built between 1904 and 1920, 17 coaches and a large number of goods wagons. The illustration shows engine No. 1 in retirement. It was built by the Hunslet Engine Company of Leeds in 1904, and is an 0-6-0 side tank engine with two outside cylinders. This engine was the first imported into Cyprus, and was used in construction of the Railway and afterwards in its operation.



The first railway engine in use in Cyprus

All change for Rugby

Sport plays an important part in the staff amenities of the New Zealand Railways Department and this year the Railways Rugby Football Council will pass an important milestone when it selects a national side following the annual North-South match. This will be the first national team ever selected and it is hoped that as the practice develops a team will tour Australia. The earliest records available show that as far back as 1895 railway workers were playing rugby on an organised basis in New Zealand. Railway Rugby is not without its famous players. Not long ago five All Blacks ran on to the field to play Rugby for the Railway.

Television stars

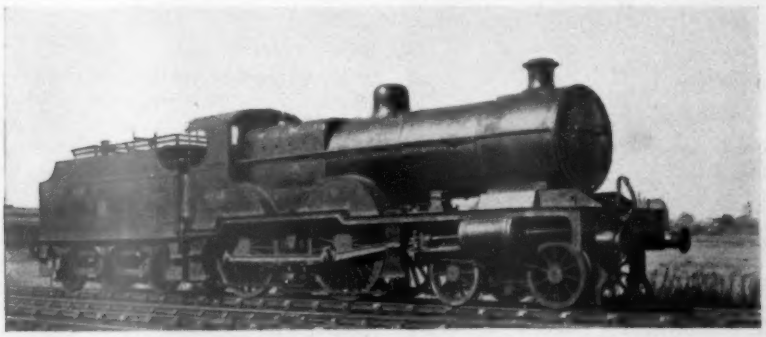
Four veteran locomotives travelled 15 miles from Derby locomotive works in the London Midland Region of British Railways, to Wirksworth, Derbyshire, on September 6, to appear in a television programme. The locomotives, which travelled coupled together, were built in 1928, 1902, 1897 and 1866 respectively.

Old masterly

At Fenchurch Street Station in the Eastern Region of British Railways, a notice was displayed recently which said "Please watch out for painting" to which had been added the word "Goya?"

Last of the standard compounds

Locomotive No. 41168, last of the Class 4P 4-4-0 standard compounds, is to be broken up. Originally numbered 1168 this locomotive was one of 25 built by the Vulcan Foundry, Newton-le-Willows, in 1925, for the London Midland & Scottish Railway to the designs of Sir Henry Fowler. This locomotive has run 938,101 miles mainly on express passenger trains. The first Midland Compound, from which the L.M.S. version was developed, was number 2631, renumbered 1000 in 1907 and built at Derby to the designs of S. W. Johnson, Locomotive Superintendent of the former Midland Railway. The design was modified by Mr. Johnson's successors, R. M. Deeley and Sir Henry Fowler and No. 1000 is now restored to its 1914 condition and is used for hauling special trains chartered by Railway Societies and other interested bodies. The principal differences between the L.M.S. Standard Compounds and the former Midland Railway Compounds in their final condition was a reduction in the driving wheel diameter to 6 ft. 9 in. from 7 ft. and left hand instead of right hand drive.



Locomotive No. 41168 the last of the standard compounds

In the doghouse

Railway police are reported to be searching for the missing Greyhound Cesarewitch cup, valued at £750. It was put on a train in Glasgow and vanished on the journey to West Ham.

Arch conspirators

The Victorian Society, the Society for the Preservation of Ancient Buildings, and Mr. John Betjeman have joined forces to raise £90,000 to preserve the Doric Arch at Euston Station. This is the sum for which it is claimed the arch can be moved on rollers. It is hoped that the London County Council can be prevailed on to agree to have it moved to a site nearer Euston Road.

The contractors are to start pulling it down this week in preparation for the Euston Station reconstruction scheme.

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

NEW ZEALAND

Vans on expresses to be placed in rear

The practice of placing any extra vans at the rear instead of at the front of expresses has been reviewed by the Government, but it was considered that the present method of marshalling in rear gave greater safety, the New Zealand Minister of Railways recently announced in Wellington. He explained that only regular express-train carriages were equipped with automatic drawgear which was stronger than the normal-type drawgear fitted to vans and wagons. Although vans could be coupled behind the locomotive, any gain in safety in collisions was more than offset by the greater risk of the train parting, because of the weaker drawgear, in the event of derailment. This strength of couplings was an important feature in avoiding serious damage to expresses as now marshalled, comprising steel-panelled carriages with specially-designed anti-collision ends and automatic drawgear, offered the minimum hazard in the event of accident, the Minister said.

UNITED STATES

Locomotives delivered

The Union Pacific Railroad Company has recently taken delivery of four Alco

2400-h.p. diesel-electric locomotive for Union Pacific Railroad Company

locomotives. They are of the DL-640 2,400-h.p. diesel-electric type fitted with a 16-cylinder turbo-supercharged engine and four traction motors and have been designed for high-speed freight services.

IRAQ

Diesel locomotives from the U.S.S.R.

A contract has been signed between Iraq and the Soviet Union, within the framework of the Iraqi-Soviet Economic and Technical Co-operation Agreement, whereby the Soviet Union will supply the Iraqi Railways administration with 25 standard - gauge diesel - electric locomotives. The contract is stated to be worth about £1·7 million and payments will be drawn on the line of credit of about £16 million made available to Iraq by the U.S.S.R. in August 1960 for the supply of equipment for the conversion of the Baghdad-Basra railway to standard gauge. It is understood that the locomotives will be supplied from Czechoslovakia. Five of them will be shunting locomotives, and the remaining 20 main-line locomotives each of 1,650 h.p. Five of these are to be supplied at the end of 1962 and the remainder before the end of 1963.

Similar contract for concrete sleeper factory

Another contract has been signed with the Soviet Union under the terms of the same agreement for the supply of a factory to make concrete sleepers for the Iraqi Railways administration. The factory will be supplied from Hungary and will have a capacity of 1,000 standard-gauge sleepers a day. It is scheduled to begin production in April, 1962, and the estimated cost of the equipment is £250,000.

GERMANY

Lifting a station

In preparation for the electrification of the Düsseldorf-Wuppertal-Hagen line, it became necessary to gain increased clearance for the catenary at Sonnborn, where the station buildings are on an overbridge spanning two tracks and connecting two platforms. Hydraulic jacks were put under each end of the complete building and bridge girders and the 365-ton structure lifted 4 ft. 3 in.; then after the abutments were erected the structure was lowered on to these, at a height of 2 ft. 7 in. above the original level.

HOSPITAL FOR RAILWAY STAFF IN INDIA

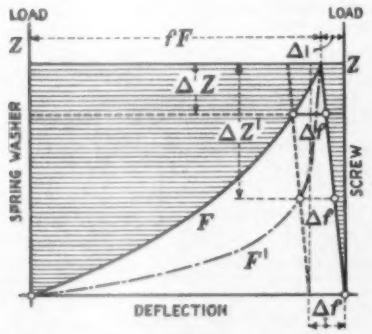
Hospital building at Jhansi, central India

SPRING WASHERS for rail fastenings

Important effect of a small-size detail on day-to-day efficacy of the permanent way

MORE than a little of the day-by-day efficacy of present-day permanent way has come to depend on one detail: the spring washer under the screw anchoring the flat-bottom rail to the bearing plate and sleeper. A special function of the screw is to maintain contact between the rail foot, bearing plate, and sleeper at maximum pressure, and at an unvarying pressure. This pressure is needed to reduce rail creep and give the track some lateral stability, particularly with long welded rails.

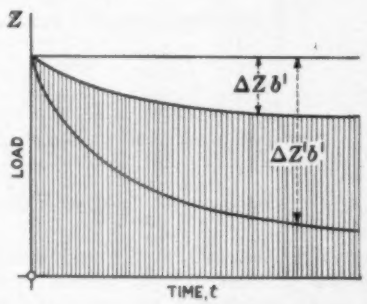
The screw is subject to considerable tension, and in modern practice this seems to be maintained best by a spring washer, which, by reason of the nature and intensity of the forces arising from the passing of 20-ton axle-loads over the rails at 85-90 m.p.h., needs to be of special design and closely-controlled manufacture. In fact, the permanent-way spring washer has come to be one of the most specialised items of railway equipment. The spring action must be equal to the tension on the screw; and the function of the spring washer is to take up all deformations and changes in position of the assembly, and in a manner such that no more than a small loss in tension can occur in the screw itself. Effects of reduction in tension are along the lines shown graphically in Fig. 1.



fF = compression of spring washer at Zf
△l = elongation of fastening screw at Zf
△f = vertical deformation of
F = spring characteristic and △Z reduction of tension load with good spring washer
F¹ = spring characteristic and △Z¹ reduction of tension load with poor spring washer

Fig. 1.—Determination of reduction in tension load, ΔZ, from the deflection load diagram of spring washer and fastening screw

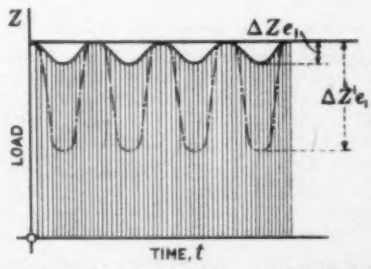
Permanent way deformation caused by the varying loads imposed by the passage of a train is elastic and of short duration but there is also a permanent deformation which increases slowly, due to plastic compression of the base plates and sleeper surface and to wear of components. The spring characteristics of the washer to compensate for these depend especially on the exact shape, but on material and dimensions also.



Reduction in tension load △Zb¹ as result of permanent deformation △fb¹ in rail fastening and p.w. assembly. Term △Z¹b¹ shows the conditions with a poor spring washer

Fig. 2.—Reduction in tension load from permanent deformation

Plus or minus variations in tension, see ΔZ in Fig. 2, must be controlled by the



Reduction in tension load △Ze₁ as a result of elastic deformation △fe1 in permanent way assembly; term △Z¹e₁ shows the conditions with a poor spring washer

Fig. 3.—Reduction in tension load from elastic deformation

elastic deflection of the spring washer; they must also be carefully considered, in relation to permanent deformation, from the view-point of fatigue, as in Fig. 3. The yardstick for measuring the capacity of a spring washer is simply its ability to take stresses under heavy loads. These washers are therefore not designed in the form of a regular spiral, but include corrugations in the coil of a particular size and shape. If such washers are gradually loaded, a soft springing results,

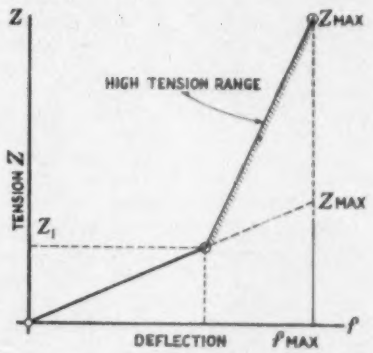


Fig. 4.—Deflection diagram of heavy-duty spring washer

as shown in Fig. 4; but as a result of the existing torsional loading, as soon as the washer coils reach a predetermined

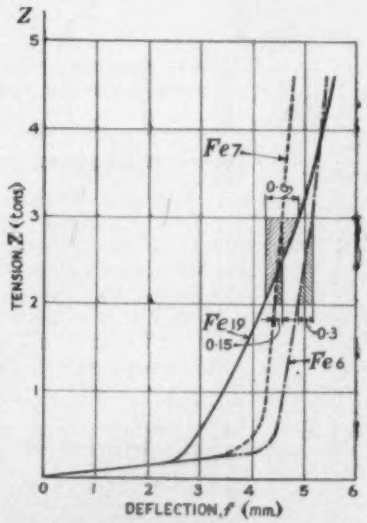


Fig. 5.—Characteristic curves of Vossloh heavy-duty single (Fe 7), double (Fe 6), and triple (Fe 19) spring washers

pressure Z_1, the springing becomes harder. Simultaneously a considerable increase in resistance arises, which

Continued on page 366

WELDED BRIDGE CONSTRUCTION on Italian Railways

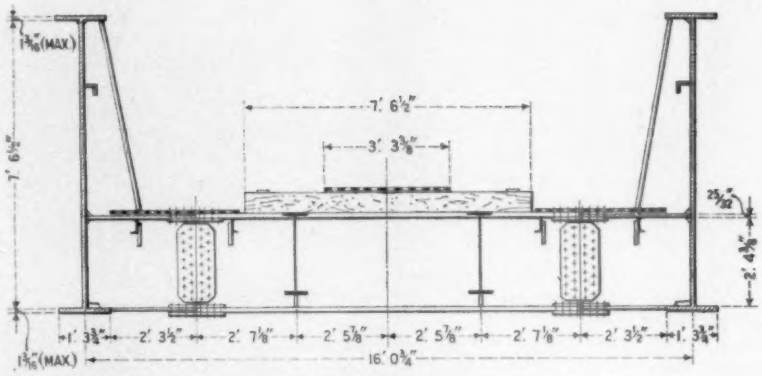
Through-type 39-ton superstructures, delivered at site in four completely-welded parts

DURING 1960 it became necessary entirely to renew the superstructures of three bridges on the Bicocca–Syracuse section of the Catania-Syracuse line of Italian State Railways.

The new spans of all three are identical, being of through-type plate-girder design measuring 70 ft. 10½ in. between centres of bearings. The principal components of each span were of welded construction and the weight of the span including pedestal-bearings, walkways, and sleeper-fastenings is only about 39 tons; a similar all-riveted structure would have weighed some 51 tons. In steelwork alone the saving in weight was about 23·5 per cent. The field-work connections were riveted.

General design

The main girders are 7 ft. 8⅞ in. deep and are spaced at 16-ft. 0¾-in. centres, the bridges carrying only a single line. An unusual feature is that there are only five cross-girders including those over the bearings so that they are as much as 17 ft. 9 in. apart. Each is fabricated in three parts approximately 3 ft., 10 ft. and 3 ft. in length. The end 3-ft. lengths are welded up as parts of the main-girder assemblies, and the centre 10 ft. and the stringers form another, or rather two welded assemblies, as the stringers are each fabricated in two lengths. By this means only 12 joints have to be riveted up at site, two in each of the five cross-girders and one in each stringer. The stringers are spaced at 5-ft. centres.



Section through bridge span

This design also facilitated the railing of the spans to site as each went in four main parts—the whole of each part having been completely fabricated by welding—(1) and (2) the main girders and ends of the cross girders, and (3) and (4) the two halves of the stringers with the central parts of the cross-girders welded to them. The only other parts, namely the bracings, pedestal-bearings, and walkway plating, went as separate loads.

It is noteworthy that there is a secondary system of triangular horizontal bracings connecting and at the level of the upper flanges of the stringers. This

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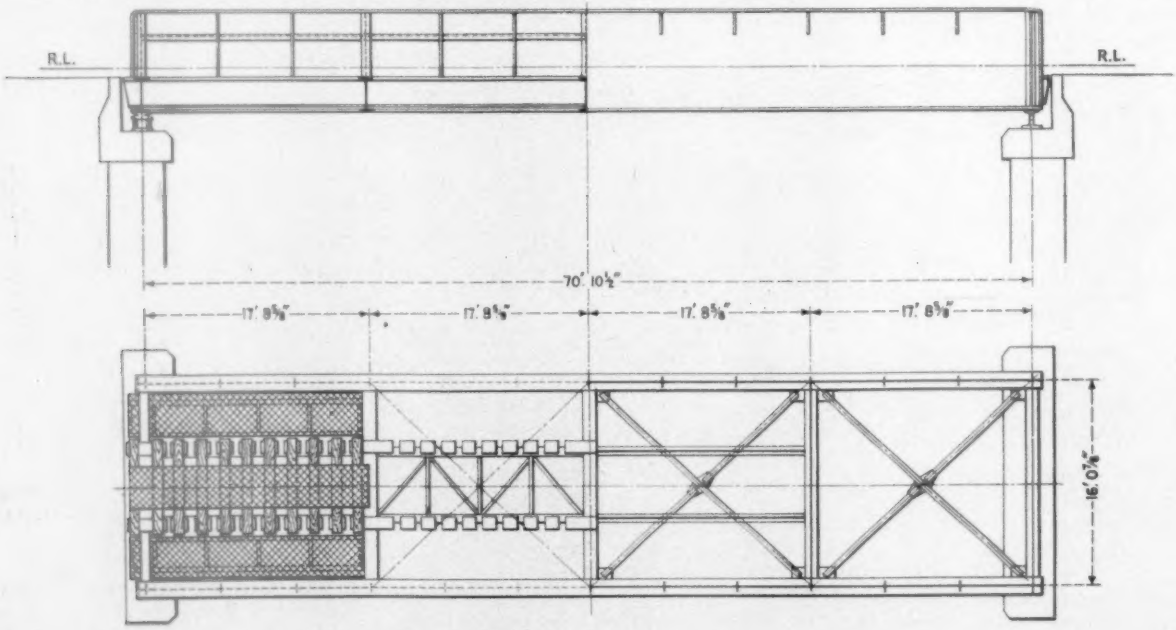


Side elevation and plan view of bridge span

CARRIAGE AND RAILCAR BOGIES: their design and development—V

This part describes experience gained in ride evaluation and road trials

by J. L. KOFFMAN, *Design Engineer (Projects), Chief Mechanical Engineer's Department, British Railways Central Staff*

DEFINITE assessment of riding qualities should not be left to subjective impressions of personnel, however competent, particularly not so far as bogies in the development stage are concerned. Personal likes and dislikes, pre-conceived ideas and possible auto-suggestion cannot entirely be ruled out. Even with the best will in the world, it is not always possible to gain a clear appreciation of the dynamic action of a bogie vehicle. Thus, for example, it is difficult to distinguish to what extent the impression of undue rolling or swaying is caused by large amplitudes of purely lateral oscillations of swing links or by rolling on springs—or both—or whether hunting is the major factor.

Assessment of riding qualities

The determination of bolster-spring oscillation amplitudes, swing-link displacements, and their phasing will provide clarity here. Opinions can also differ regarding poor action of suspension in the vertical plane, the cause being possibly attributed to inadequate static deflections by some and to insufficient damping by others. Here, knowledge of displacement amplitudes, natural frequencies, and the pattern of oscillation decay will provide guidance and indicate measures to achieve improvements. The assessment of riding qualities should be carried out with the aid of ride index evaluation, for no absolute reliance can be placed on the opinion of observers whose views are likely to differ depending on their previous experience (originally most diesel locomotives rode " very well indeed " for they were better than steam locomotives), training, or prevailing state of mind and well-being.

To begin with, it is desirable to ascertain the natural frequencies of bouncing, pitching, and rolling/swaying with the aid of " wedge " tests, carried out with the aid of a vibrograph. Fig. 1.

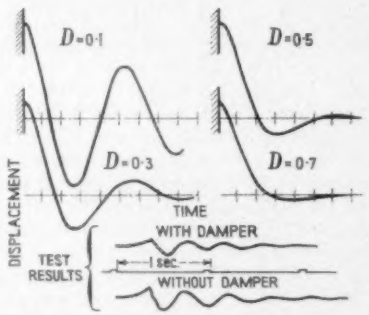


Fig. 1—Wedge tests provide information concerning natural frequencies and damping factors

The results will serve to assess the effectiveness of primary and secondary springs as well as of the complete assembly. The pattern of oscillation decay (wedge tests) permits determination of damping factors, knowledge of which is of considerable assistance when considering vehicle behaviour on the road. The frequency of lateral/swaying oscillations can be better determined by placing the vehicle on a transfer table and imparting an impulse by suddenly stopping the moving table. Similarly, body-nosing can be excited by placing the vehicle on a turntable, the centre of gravity of the body being in line with the centre of rotation. A sudden stop of the turntable will then excite body-nosing oscillations at their natural frequency.

It should be stressed, however, that as far as vertical body oscillations are concerned wedge tests are not fully representative of road conditions since at high speeds the primary springs are called for to deal predominantly with bogie pitching oscillations.

The knowledge of the forces required to displace the vehicle body laterally is of value when considering effective length of the swing links and friction present in the system. Results of such tests are plotted in Fig. 3, the values being ascertained under static conditions. The mean force-displacement characteristics over the entire range are indicated by 1. For small displacement, the mean slope indicated by 2 will be appreciably increased, the resultant force being to some extent responsible for the lateral " judder " occasionally experienced even with modern vehicles. This in turn can be responsible for an unpleasant ride and for spilling liquids in dining-cars.

Effect of friction

The effect of friction on the pattern of lateral accelerations is shown in Fig. 2. The upper record shows the presence of higher frequencies superimposed on the basic frequency. Reducing lateral friction has substantially reduced the incidence of higher frequency accelerations.

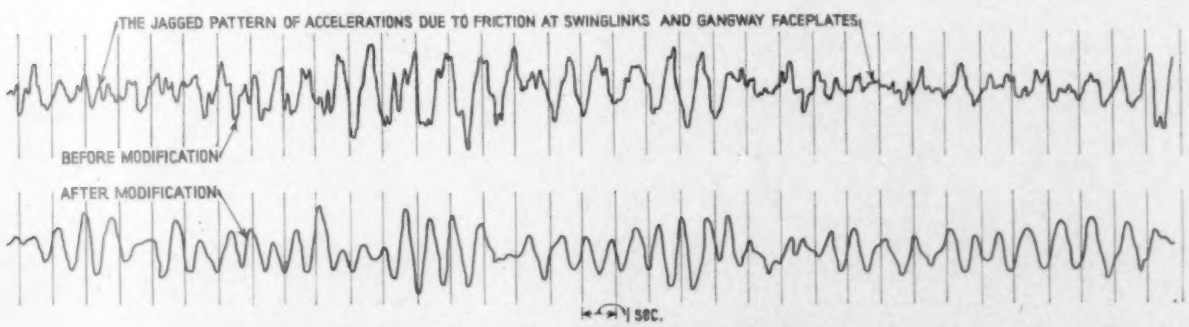

THE JAGGED PATTERN OF ACCELERATIONS DUE TO FRICTION AT SWINGLINKS AND GANGWAY FACEPLATES
BEFORE MODIFICATION
AFTER MODIFICATION
1 SEC.

Fig. 2—Effect of frictional forces on pattern of lateral oscillations of vehicle body

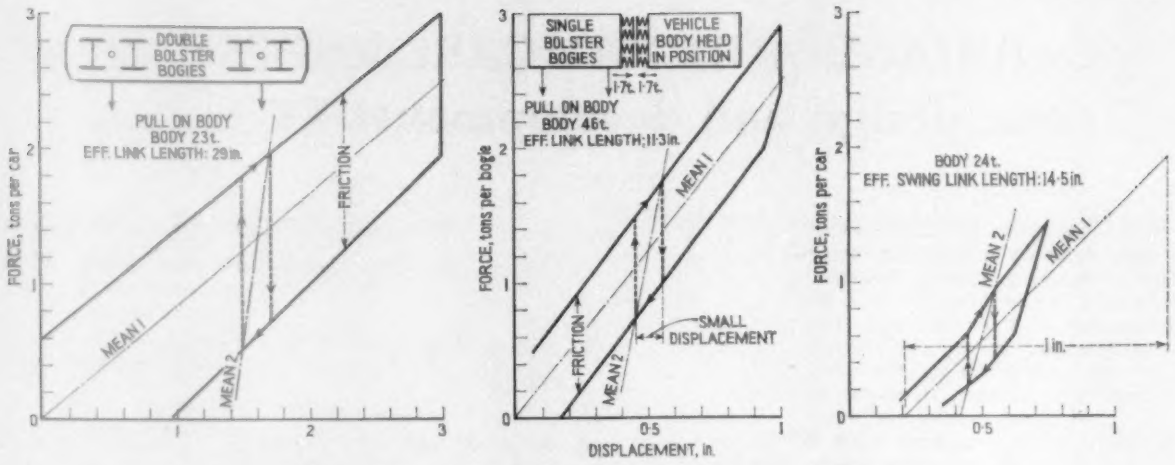


Fig. 3—Lateral friction forces can be responsible for poor riding qualities

It will be desirable to carry out these determinations as soon as possible after completion of the prototype vehicle, because the resultant information will be of appreciable value when considering results of road trials before contemplating full-scale production.

Modern instrumentation permits rapid recording of complex oscillation and force patterns. The records are usually considered in general terms but they are less frequently analysed or they are painstakingly analysed in great detail and the results presented in lengthy reports many months after the event. When shortage of time precludes the tolerance of lengthy intervals, use must be made of short cuts which would provide information without unduly affecting reliability of results. One such method developed by Leven, and adopted for locomotive-testing record evaluation by the DB and the OBB and also by Committee B.10 of the O.R.E., determines significant forces and displacement values as follows. The record taken over 200 metres of straight track is evaluated in terms of maximum and mean values. The first is obvious. The second is determined by moving a straight edge covering the full length of the record downward until it touches five peaks or comes below four peaks just touching the fifth. This then is the " most frequently encountered " mean value. For records taken in curves, the same procedure applies for the length of 200 metres, the average value being given by the height of ten simultaneous peaks for the tendency is towards one-sided running of the vehicle. Fig. 4.

Road trials

Every new vehicle type should be subjected to road trials and results evaluated in terms of ride index values To do

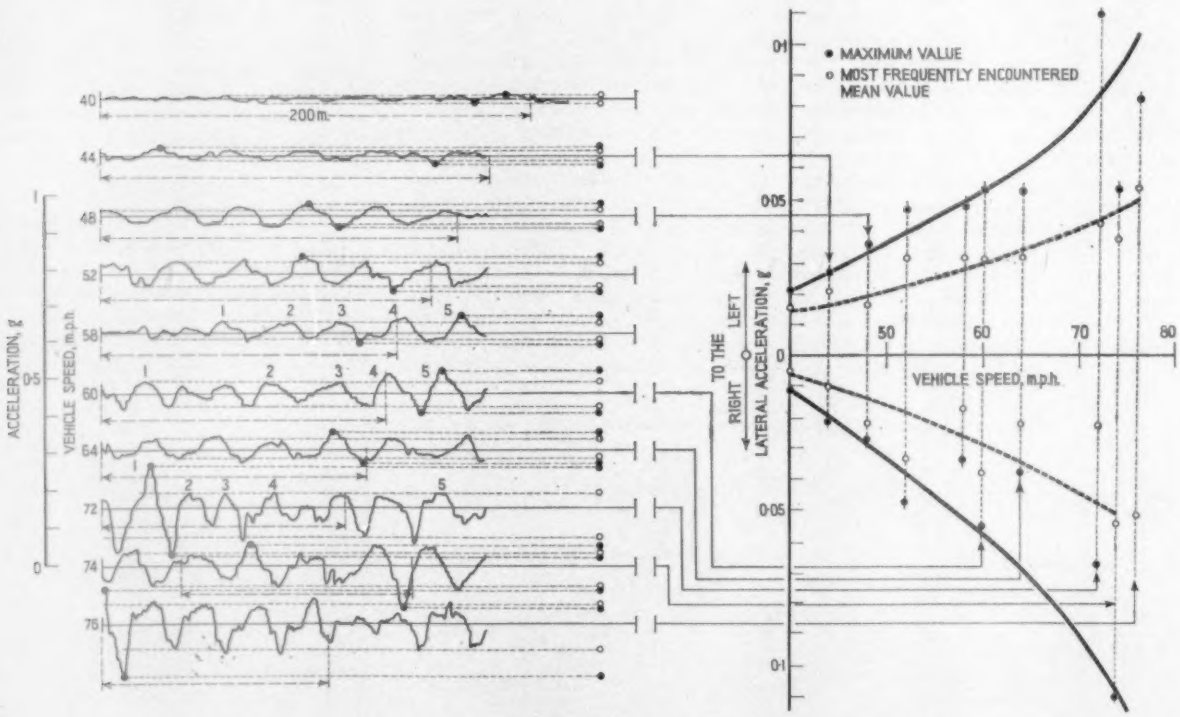


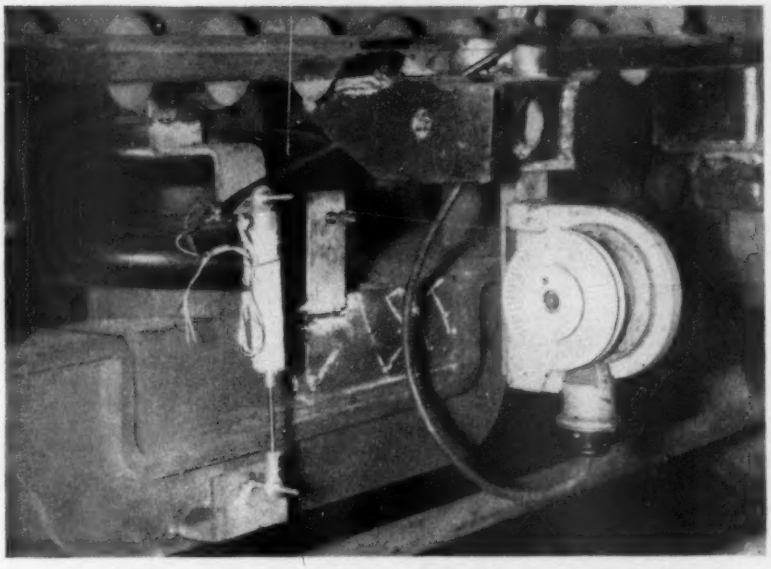
Fig. 4—Determination of maximum and mean lateral accelerations of carriage along simplified lines

this, ride qualities must be recorded with the aid of accelerometers or vibrographs. In addition to permitting rational assessment of riding qualities, the records often provide information regarding the causes for a certain pattern of behaviour. There is no shortage of recording accelerometers as originally evolved for use with aircraft and road vehicle development work.

Pattern of displacements

The determination of the cause of unpleasantly-intense oscillations requires the knowledge of the pattern of displacements of such components as springs and swing links, as well as of complete bogies, relative to the vehicle body. This information can be secured with the aid of suitable variable-resistance elements mounted between axlebox and bogie frame and between bolster and bogie frame to record the vertical displacement of primary and secondary springs respectively.

Mounting such units laterally between bolster and bogie frame will record lateral bolster oscillations. Providing them between two ends of the bogie frame and body will facilitate the recording of the rotational motion of the bogie *vis-a-vis* the body. The recording is facilitated by the use of portable oscillographs available for 12 and more simultaneous records. Subsequent evaluation is facilitated by time-interval marks made every second across the record and by event marks made as required, Fig. 5. Thus, the accelerations recorded on the cab floor of a modern electric locomotive, Fig. 6, show the effect of dampers fitted across the axlebox springs, while Fig. 7 shows the effect of speed and dampers on the amplitudes of spring oscillations, this being of importance as far as dynamic clearances, spring stresses, and the service life of springs is concerned.



Potentiometers secured to record vertical and lateral bolster oscillations

The information thus obtained is of great value in connection with requirements regarding spring stresses and manufacture. Further evolution of bogies, particularly for locomotives, will make it desirable to measure lateral and vertical forces emanating at the wheels and, while facilities for this work are available, these

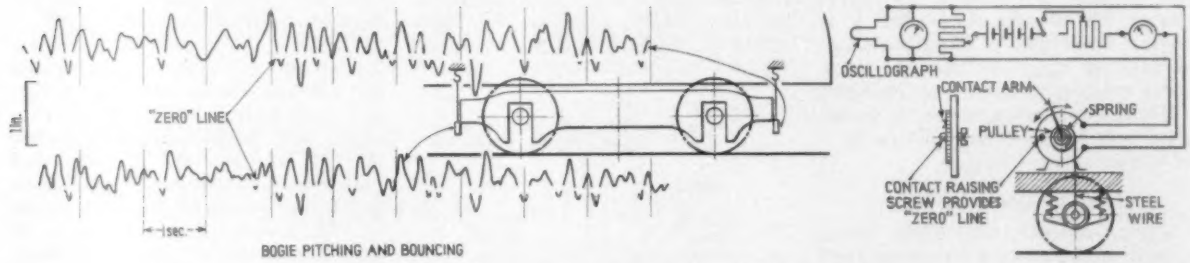


Fig. 5—Scheme of rotary potentiometer for recording displacements

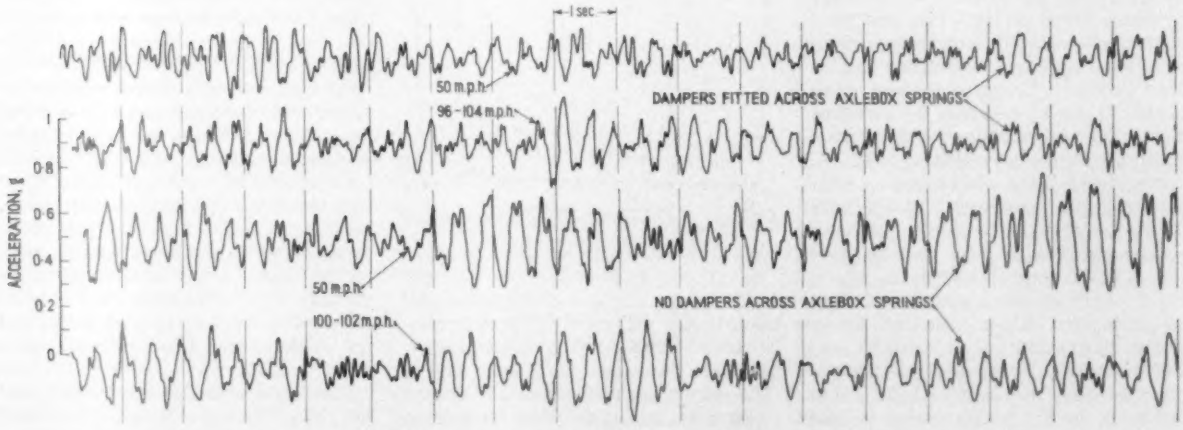


Fig. 6—Effect of dampers on oscillations at cab floor of bogie locomotive

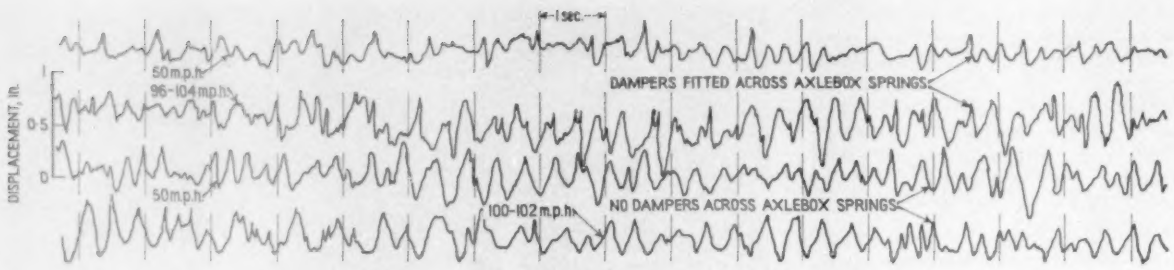


Fig. 7—Effect of dampers on primary spring oscillations of bogie locomotive

are outside the scope of present considerations.

Attention should be drawn to the fact that lateral accelerations encountered when testing on wet rails can be rather low compared with the magnitudes faced by the same vehicle on dry rails, Fig. 8. This must be allowed for when carrying out developments or comparative tests and acceptance trials.

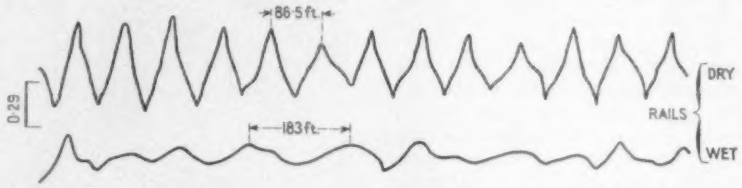


Fig. 8—Effect of rail conditions on vehicle test results. Lateral accelerations over leading bogie of electric locomotive at 95 m.p.h. (Courtesy M. Mauzin)

Spring washers for rail fastenings

(*Concluded from page* 361)

compresses the corrugations in the coils.

The compression potential of spring washers is increased considerably by these special corrugations. Maximum compression strength Z_{max} (Fig. 4) is reached at the point of maximum actual compression f_{max}. Without the additional bending moment, but operating simply as a coil spring, the spring washer could only carry out its function for a far smaller value of Z_{1max}.

Increased number of coils

Single, double, and triple spring washers have been used for several years by a number of main-line railways carrying heavy traffic, and the three standard forms of Vossloh precision-made types are known as Fe7, Fe6, and Fe19 respectively, and all with cross-sections of 10 mm. by 6 mm., and suited to $\frac{7}{8}$ in. dia. screws. Comparing these three models, it can be seen that the increased number of coils enables the number of corrugations to be increased; that is, under heavy duty the spring washer becomes more resilient, and therefore more efficient in its particular functions.

Characteristics of these three types of spring washers are shown graphically in Fig. 5. With an initial tension of 2 tons, an extra load ΔZ of one ton brings spring movements of 0·15 0·30 and 0·60 respectively for the single double and triple washers, i.e. ratios of 1: 2: 4. On this basis the Fe7 single washer is used where track conditions and loading lead only to low working deflections in the fastening assembly; the triple-coil washer Fe19 is used when high values of Δf are found and the double-coil Fe6 under average conditions.

Even under good conditions only a comparatively small vibrating load can be absorbed by the normal fastening assembly and from this point of view it is better to use a heavy-duty washer, for the longer the corrugations, the lower will be the change in loading with a given spring movement; and also less frequent tightening of the screw will be necessary. In other words, it meets the International Railway Congress finding (Madrid, 1958) that there is a definite preference for really tight fastenings, otherwise the addition of anti-creep devices at the rail ends may be needed.

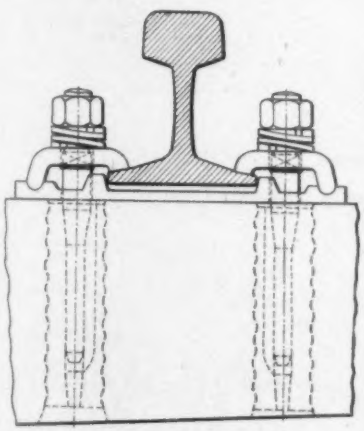


Fig. 6.—Section through flat-bottom rail with Vossloh spring washers

Welded bridge construction on Italian Railways

(*Concluded from page* 362)

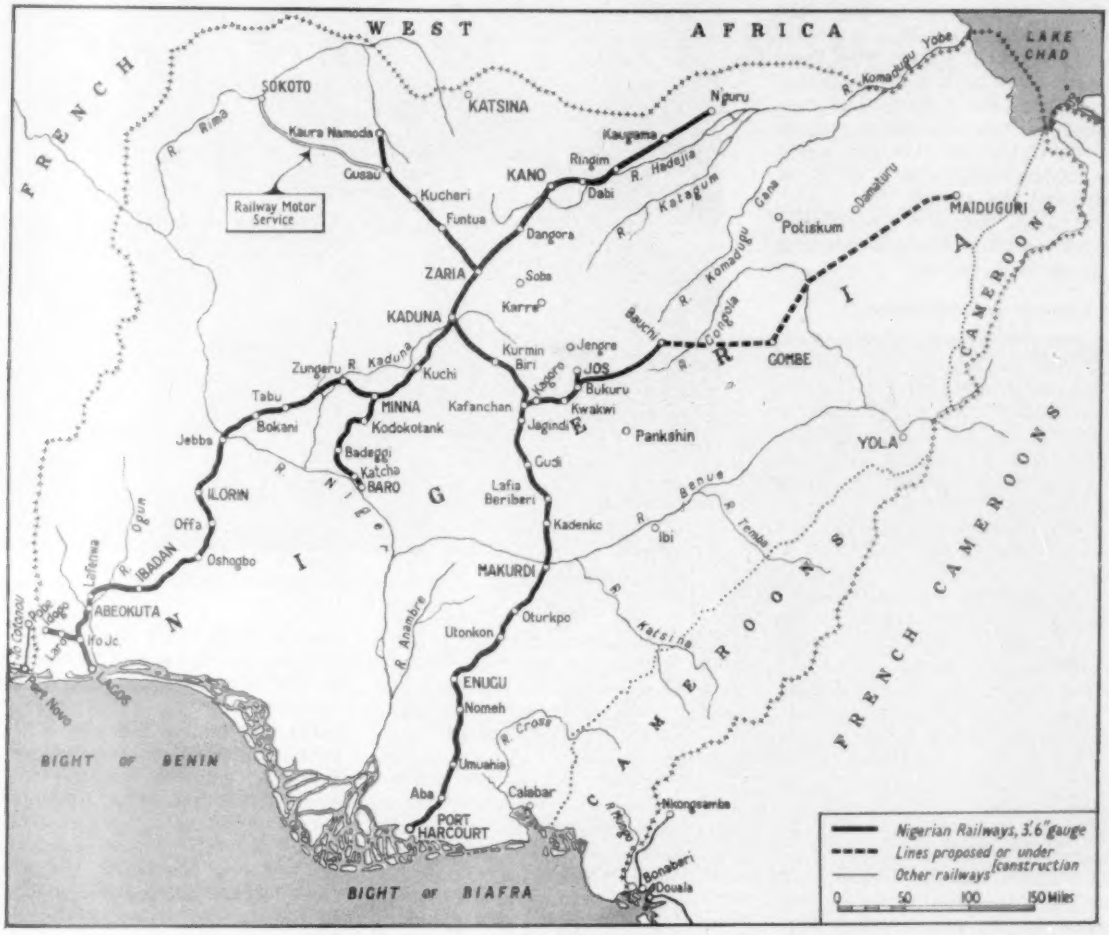
presumably would be necessary for the carriage of the combined stringers and central parts of the cross-girders. Normal main bracing is provided between the lower flanges of the main girders.

The heavy T-shaped connections—functioning as combined shear-plates and stiffeners—between the main girders and cross-girders may be noted. Together with the cross-girders after erection they provide a rigid channel-shaped transverse frame calculated to counteract any lateral weakness in the top flanges in compression. The outer faces of the main girders are free of stiffeners. On the inside there are equi-spaced vertical stiffeners at 5-ft. 11-in. centres and also a single horizontal stiffener about 1 ft. 8 in. below the top flange.

Components shop-welded

All components of the main and cross-girders and of the stringers such as webs, flanges, and stiffeners, were shop-welded as separate units to permit unrestrained contraction and avoid distortion. They were then assembled and welded together. Wherever possible, welding was done concurrently on both sides after the edges of the plates had been chamfered by planing. The shop-welds were checked for possible flaws by magnetoscope, and the joints in the tension flanges were examined by X-ray.

Erection was carried out by the usual method of transverse rolling the old and new spans simultaneously on to and from falsework on each side.



Map of Nigerian railway system

THE BORNU EXTENSION of the Nigerian railways

Construction of railway with modern plant and materials

FROM time to time since 1918 an extension of the Nigerian railway system to tap the eastern provinces of Bauchi and Bornu has been considered, but it could never be justified on economic grounds until 1955. In that year traffic surveys indicated that a 400-mile line from Kuru through Bauchi and Gombe to Maiduguri, in the easternmost province of Bornu, might reasonably be expected to pay its way within a few years of its completion.

After a preliminary reconnaissance by Messrs. Rendel, Palmer & Tritton, Consulting Engineers to the Nigerian Railway Corporation, an aerial survey by the Hunting Group Company was arranged; this enabled a location survey to be made by the Consultants. The map shows the alignment followed.

On the advice of the consultants it was considered that, by using diesel as opposed to steam traction on this alignment, a steeper ruling gradient of 1-in-67 (1·5 per cent), and therefore a shorter line, was feasible. It was decided to carry out the construction in six sections, namely: Kuru–Bauchi, Bauchi–Gombe, Gombe–Gongola River, Gongola River Bridge, Gongola River–Maiduguri, and buildings and installations at Bauchi.

Division of work

Work on each of these sections is being carried out under separate contract in so far as formation, bridging and buildings are concerned; ballasting and tracklaying are being done departmentally.

The whole of the contract work as well as the designs, specifications, and schedules of quantities are being supervised or prepared by Messrs. Rendel, Palmer & Tritton. Work began in 1958 and the first section to Bauchi is now so far complete that the first passenger train ran through to that station, 104 miles, in May, 1961. Construction is proceeding onward to Gombe and on the buildings in Bauchi; the construction of the Gongola Bridge is also in hand. The whole line is expected to be open by the end of 1963.

The gradient profile shows that Kuru—hitherto terminus of a branch

line from Kafanchan on the Port Harcourt–Kaduna–Kano–Nguru main line—is a summit station, the new line falling away from it on gradually-easing gradients for a distance of over 80 miles. In this distance the climb facing trains to Port Harcourt would appear to be through over 2,500 ft. in altitude, and to include the 1-in-67 ruling gradient, which is compensated for curvature. The sharpest curve is 6 deg. or about 14½-ch. rad.

Cuttings and embankments

The line will be single throughout and of the parent 3-ft. 6-in. gauge. Between Kuru and Maiduguri it is estimated that excavation in cuttings will total about 11½ million cu. yd., some 250,000 cu. yd. being in rock. The formation width in cuttings excluding side-drains is 12 ft. Scrapers, excavators, and draglines are being used for the excavation, rock—both solid and in boulder form—being drilled and blasted before removal by mechanical plant. Selected rock is being used as pitching to protect earth embankments, guide banks, and culvert outlets against scour. It is also being crushed for concrete aggregate and ballast. Such protection is very necessary as the rainfall, though it varies from 60 in. at Kuru to only 20 in. a year at Maiduguri, is concentrated in the three months June-August.

Origin of spoil

The expected quantity of soil to be thrown up as embankments is some 7 million cu. yd., and minimum width across the shoulders is 14 ft. The earth is either in the form of spoil from nearby cuttings or excavated from borrowpits. Scrapers or draglines are at work, discharging into tipper-lorries where necessary, and compacting it at site in layers. Motor graders are also being used to level the formation and trim the side-slopes, but this is also being done manually. At the beginning of each rainy season the slopes are planted with grass roots.

Aerial view of section of completed formation

Cross-drainage and bridging have had to be designed to suit topography varying from steep, rocky, broken country with high run-off to sandy park land with high absorption. Where smaller waterways suffice use has been made of culverts of from 1-ft. dia. pipes to multiple r.c. box or slab openings each up to 10-ft. span. Altogether, 800 culverts are being constructed requiring nearly 80,000 cu. yd. of concrete.

Where larger openings are necessary over 70 bridges are being built with one or more steel spans, each of from 20 ft. to 150 ft. The quantity of steelwork required for this purpose is about 2,200 tons but, as 500 tons are being obtained from renewals on the open line, purchased steelwork amounts to only some 1,700 tons. This is subject to inspection and testing by Messrs. Rendel, Palmer & Tritton in the manufacturer's works during fabrication, and is trial-erected before acceptance for shipment to Nigeria. In all, nearly 1½ miles of bridge waterway is being provided, and some 44,000 cu. yd. of concrete is being used for the abutments and piers and their foundations.

Of this waterway about half a mile is to be spanned with steel truss spans weighing about 1,100 tons; the parts are assembled and erected by riveting on site.

Vibrating roller compacting the formation

Bridge over Gongola River

The largest bridge is that over the Gongola River, between Gombe and Maiduguri. It will consist of nine spans of 150 ft. carried on concrete piers and abutments on well-foundations sunk to rock. The trusses are welded and riveted and the floor system is connected by high-strength friction-grip bolts. There will be 725 tons of steelwork and 8,000 cu. yd. of concrete in the wells, piers, and abutments.

Eleven possible sites were considered for this bridge, at three of which 100-ft. deep borings were put down. The width of the river in flood is about three-quarters of a mile, but in the dry season it is only a quarter of a mile. The flow in flood is being trained by a 1,700-ft. long guide bank to flow through the 1,350-ft. bridge opening which is the dry-weather channel. This guide bank is heavily protected with pitching stone, of which 80,000 cu. yd. will be used.

MECHANISATION OF TRACK MAINTENANCE on South African Railways

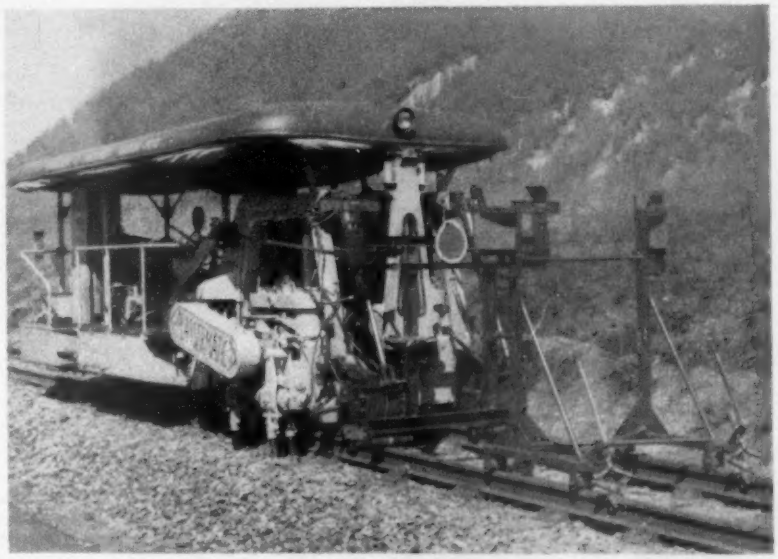
THE manually wielded "beater"-pick which has for more than a hundred years been the standard tool for consolidating track ballast on the permanent way of South African Railways is fast being replaced by power tools which are being introduced on a considerable scale in a programme of mechanisation of track maintenance, already under way for four years.

Mechanised track maintenance is a relatively new science, consequently fresh and improved machinery and devices are constantly appearing. The South African Railways are keeping abreast of developments and already a wide diversity of machines are in use.

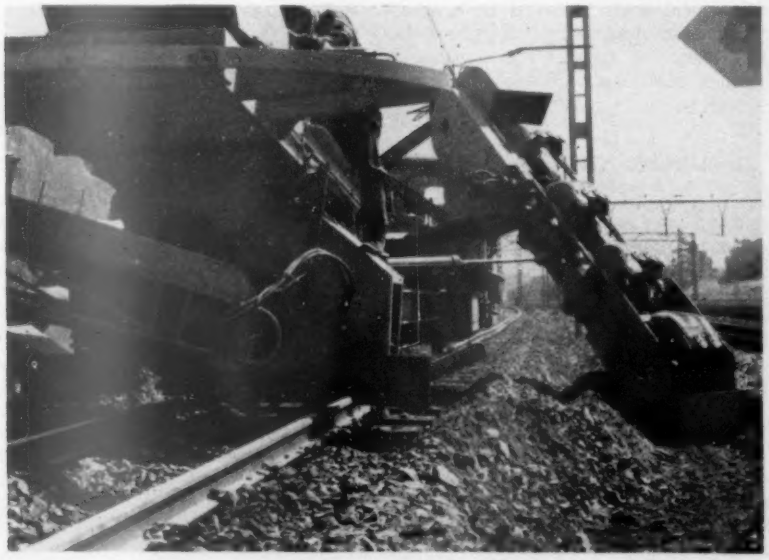
Automatic ballast tamper

The ballast tamper has become a familiar sight on South African Railways permanent way, but its tamping function has been extended by a device which enables the machine to raise and cross-level the track at the same time. The device makes use of two horizontal wires fixed to a chosen "high point," up to 600 ft. ahead of the machine. The wires are highly tensioned by means of hydraulic motors which maintain the tension as the machine works forward to the high point. An ingenious jacking mechanism attached to the front of the tamper raises the track until a contact touches the wire, which automatically stops the lifting operation independently for each rail thereby achieving the lifting and cross-levelling of the track. Tamping proceeds to compact the ballast until the pre-set density is obtained. By adjusting the cut-out contacts, transition and curve superelevations can be applied exactly and automatically. This device eliminates both the human factor and the large gang normally required to surface the track ahead of the tamper.

Replacement of manual tools by introduction of power tools



High speed ballast tamper



Ballast distributor and cleaner

Ballast distributor and cleaner

Ploughing and scarifying of the ballast bed is a well-known procedure on the South African Railways, but requires a big labour force to clean and replace the ballast. The use of the plough and scarifier places the ballast at the outside edge of the sleeper zone where it can be cleaned. This cleaning operation has hitherto been performed by hand by means of ballast forks which permit the ballast being thrown back leaving the finest behind, but here again mechanisation is taking over in the form of a ballast distributor and cleaner.

The ballast distributor is a large on-track machine which, by means of an endless bucket chain, picks up the windrows of ballast at the track edge, puts it through a vibrating screen and returns it to the track on each side of the rail in the best position for the subsequent compaction by heavy tampers. The machine will also distribute new ballast which has been dumped along the track from railway trucks, and is proving

especially useful in areas where rail traffic is most intense such as on the Reef.

Centre and side discharge ballast wagon

For many years it was contended that the use of centre and side discharge ballast wagons was not a practicality on 3 ft. 6 in. gauge.

Recently an experimental batch of 12 such wagons was built in South Africa for use on track-maintenance work and the experiment was so successful that an order for a further 100 wagons has been placed.

The old method of dumping ballast alongside the track meant that most of the stone had to be moved manually and placed evenly in the sleeper zone. The use of centre- and side-discharge wagons permits the placing of ballast between the rails as well as along the sleeper edge thus facilitating levelling and tamping.

The introduction of concrete sleepers brought in its wake the complication of achieving a consistent tightness of the elastic fastenings connecting the sleeper to the rail.

Hydraulic coachscrewing machines

As a result of extensive experiments, the hydraulically operated coachscrewing machine has been developed during the past two years. This machine, because of the speed with which it tightens the fixing nuts to the cast-in bolts in concrete sleepers, solved the difficulties experienced where the problem of correct tension on sections laid with long-welded rails is complicated by the destressing which requires that all fastenings in a half-mile length must be secured within a period of one hour. Twenty of these machines are now in use.

Radio control

Radio control of tampers is another recent innovation. Experiments have been carried out with radio transmitters and receivers mounted in heavy tampers and at stations on either side of the section being worked, to reduce delays to trains and tampers which would arise from the normal trains working methods. These experiments were successful and four complete outfits have been ordered for use on four of the fully mechanised lengths on the Orange Free State System.

RELAYING OF SUBURBAN TRACK on W.A.G.R.

Utilisation of 270-ft rail-lengths and power-worked machines

THE whole of the South West main line between East Perth and Bunbury has now been relaid except for a short length in the suburban area, work upon which is now in hand. The line is double, and between Riverdale and Armadale the berms are sandy making difficult the use of heavy off-track machines and equipment.

For this and other reasons it was decided to give the engineers occupation of one of the tracks between 10 a.m. and 3 p.m. daily, the other track being worked as a single line. This has minimised interference with the work and with traffic. The sections occupied are dependent on the positions of crossovers to divert trains, but are nowhere more than three miles in length. A problem in suburban rerailing is the high incidence of stations, points, level crossings and insulated sections generally bypassed and dealt with piecemeal.

Details of the work

82-lb. 45-ft. rails previously welded into 270-ft. lengths are being used; they are flashbutt-welded near Midland Junction and railed to site on rakes of seven bolster wagons. Unloading is effected by the rails being anchored in pairs to the track and the wagons are pulled out from under them.

A power-worked spike-puller then follows up and pulls out the old dogspikes on one rail for quarter mile. The other leg is left in position to carry the adzing machine and to facilitate gauging the new rail.

Removing the old rails

A mobile crane is used to lift out the old rails in combined lengths of up to 6 x 40 ft. which are then hauled away by tractor to be broken up ready for transit to the rail depot. Ultimately the old rails are reconditioned and classified for renewals of secondary lines. Adzing of sleepers to carry the new rail is performed by a portable machine using the remaining old rail as a base.

The crane then returns and lifts each new long rail on to its base and in position for gauging and fastening. The rail is levered into gauge by hand and a mechanical auger powered by a compressed air plant is used to bore holes for elastic rail spikes. The sequence is repeated for renewing the other side with the new rail as a base.

Additional machines used are a pneumatic close-quarter drill which can bore fishbolt holes through a rail-web in two minutes, and a Matisa rail-saw which takes only four minutes to cut through an 82-lb. rail.

The crawler tractor, besides hauling away old rails, is used to move the air compressor along the sidewidth and assists the crane where necessary. The mobile crane lifts machines on and off the track as required as well as handling the heavy lengths of rail.

STAINLESS-STEEL SUBURBAN TRAINS

The first of the new stainless-steel suburban trains being built for the Queensland Railways by Commonwealth Engineering Pty. Ltd. was handed over early in August. It will go in service for immediate operation in northside areas covering Shorncliffe, Petrie, Sandgate, Ferny Grove, and Ipswich.

TERMINAL BUS STATION

A 60-platform long-distance bus terminal is to be built on land in the New Port of Buenos Aires, adjacent to Retiro station. Smaller terminals will be built at other strategic points.

EXPRESS CATTLE WAGONS

A new type of cattle wagon on the W.A.G.R. is suitable for small consignments of cattle by express goods trains. It is divided by a central partition and has four doors giving access to both compartments; 18 head, or a maximum of nine in each compartment, can be carried, and baby beef can be separated from stock cattle. High-speed bogies are fitted to these 15-ton 7-cwt. vehicles, which can be used with advantage on special cattle trains run at express-goods speeds over long distances, such as 600 miles scheduled in 24 hr. They will normally run on the fast overnight goods services, for which older types were unsuitable.

PERSONAL

Institute of Transport

MR. JAMES AMOS, O.B.E., M.INST.T., Chairman of the Scottish Omnibus Group, who, as recorded in our issue of May 12, has been elected Chairman of the Institute of Transport for the year commencing October 1, was President of the Scottish Road Passenger Transport Association for 1948-49. After the 1914-18 war, he started road operations and formed the company of Brook & Amos Limited, which in 1926 was acquired by the Scottish Motor Traction Co. Ltd. He was subsequently appointed General Manager of the S.M.T. bus interests, and a Director & Vice-Chairman. When the company was acquired by the British Transport Commission, in 1949, Mr. Amos became a part-time member of the Commission and Chairman of the Scottish Omnibus Group.

Mr. James Amos

British Transport Commission

MR. T. H. HOLLINGSWORTH, M.INST.T., Traffic Adviser, British Transport Commission Headquarters who, as recorded in our September 22 issue, has retired, was educated at Cardiff and began his railway career with the Great Western Railway in that city in 1913. After serving in H.M. Forces during the 1914-18 war he returned to Cardiff before being selected in 1923 for a four-year course of special training in the Goods, Traffic and Docks Departments. After completion of this training he was employed at Aberdare for a short time before being transferred in 1929 to the Chief Goods Manager's Office, Paddington, as an outdoor investigator responsible for staff and terminals work. In 1933 he became District Cartage Controller, Swansea, and later returned to Paddington to take charge of the Staff Investigation Committee. After serving

Mr. T. H. Hollingsworth

as Chief Clerk in the Chief Goods Manager's Development Department he was in 1938 appointed Assistant District Goods Manager, Cardiff. He became District Goods Manager at Worcester in 1942 and moved to Bristol in a similar capacity in 1944. Mr. Hollingsworth was appointed General & Staff Assistant to the Chief Goods Manager in 1946 and, in 1948, Principal Assistant. On January 1, 1950, he was appointed Commercial Superintendent of the Scottish Region with headquarters in Glasgow, a position which was subsequently re-designated Chief Commercial Manager. Mr. Hollingsworth was made Traffic Adviser, British Transport Commission in 1956.

British Railways

MR. R. A. LONG, Commerical Superintendent (Great Eastern), Liverpool Street, British Railways, Eastern Region, who has been appointed an Assistant General Manager, Scottish Region, joined the former London & North Eastern Railway at Leeds, in 1935. After gaining experience at various stations, and in district and headquarters commercial offices in the North Eastern Area, he completed the training of a Traffic Apprentice in the Southern Area. After a period on the relief staff as a Station Master and on special duties, he was appointed Assistant to the District Superintendent, Manchester, in 1942. The following year he entered the Rates & Statistics Section of the Chief General Manager's Office. In 1944 he became Head Office Inspector to the Superintendent (Southern Area), and Locomotive Running Superintendent (Western Section), and subsequently occupied the positions of Deputy Chief of the Trains Section and Chief of the Timetable Section in the office of the Passenger Manager (Southern Area). In 1948, he became Chief of the Central Timing and Engine Diagramming Section, Southern Area (Eastern Section), and in the following year he was appointed Trains Assistant to the Operating Superintendent (Eastern Section). He became Assistant (Freight Trains) to the Operating Superintendent, Eastern and North Eastern Regions, in 1950 and, a year later, joined the Traffic Costing Service, British Transport Commission Headquarters, as a Traffic Costing Officer. Mr. Long was appointed Senior Traffic Costing Officer, Liverpool Street, in 1953, and was later redesignated Principal Traffic Costing Officer. In addition, he took administrative charge of the Economic Survey Office, Eastern Region, from its inception, in 1957, and was appointed Economic Survey Officer the following year. In 1960 he was appointed Commercial Superintendent (Great Eastern).

Mr. R. A. Long

MR. S. L. F. ALLEN, formerly Deputy Traffic Manager, British & Irish Railways Inc., New York, has been appointed Divisional Public Relations Officer, Merseyside & North Wales Division, British Railways, London Midland Region.

MR. P. D. M. INGS, Traffic Costing Officer, East Midlands Division, British Railways, London Midland Region, who, as recorded in our August 18 issue, has been appointed Finance Assistant to the Line Traffic Manager, Derby, commenced his railway career with the former Great Western Railway in 1938, at Cardiff. After station and district office experience he took up an appointment in 1949 with the Road Haulage Executive. In 1951, Mr. Ings became Executive Assistant in the office of the Chief Traffic Officer at B.R.S. Headquarters, and in 1953, Assistant Traffic Costing Officer, Paddington, British Transport Commission Costing Service. In

Mr. P. D. M. Ings

1956, Mr. Ings was appointed Traffic Costing Officer, Paddington, and, in 1958, he became Traffic Costing Officer, East Midlands Division, British Railways, London Midland Region.

MR. H. SHEARD, Assistant to Commercial Superintendent (Claims) British Railways, London Midland Region, who, as recorded in our September 15 issue, has retired, entered the service of the former London North Western Railway Company in the Goods Depot at Leeds in 1915. After acting as a relief clerk at various stations he became Accounts Clerk at Dewsbury, later joining the District Office Accounts and the Commercial Department. In 1930 and 1933 Mr. Sheard served under the Chief Goods Manager and was engaged on special enquiries into station working methods as affecting claims. Subsequently he was appointed as an Headquarters Claims Prevention Inspector and was later transferred to Euston as Head of the Claims Prevention Sub-Section. During the last war Mr. Sheard was attached to the L.M.S. Vice-President's Office as assistant to the Salvage Officer, returning to the Chief Commercial & Chief Operating Manager's Departments as Head of Section (Claims Prevention) in July, 1944, and in 1948 was detached for assistance to the Chairman of the Railway Executive *ad hoc* Committee on goods lost and stolen. Mr. Sheard returned to the Commercial Superintendent's Claims Office in 1949 as Head of Section, Claims Liability and in 1950 became Head of Section, Claims. He became Assistant to Commercial Superintendent (Claims) in 1952.

Mr. H. Sheard

Overseas

MR. S. S. KOCHAK, Chief Electrical Engineer, North Eastern Railway of India, who has been appointed Chief Electrical Engineer, Eastern Railway, was selected as a Special Class Apprentice (Electrical) by the Indian State Railways and was posted to the East Indian Railway workshop at Jamalpur on April 1, 1936, for practical and theoretical training. From there he passed the associate examination of the Institute of Electrical Engineers, London. On completion of six years' course of training, Mr. Kochak was appointed Assistant Electrical Engineer in the junior scale of Superior Revenue Establishment of State Railways in 1942 and was posted on the former East Indian Railway. He was promoted to the senior scale as District Electrical Engineer in February, 1948, and continued to serve on the Eastern Railway after it was formed following the regrouping of the Indian Railways on April 14, 1952. In February, 1955, Mr. Kochak was sent to Canada by the Government of India for higher studies in large-scale thermal-power stations under the Colombo Plan and, on return from overseas, was posted on the Eastern Railway as its Deputy Chief Electrical Engineer. He was later transferred to Railway Electrification Project in Calcutta before going to the North Eastern Railway, in 1959, as Chief Electrical Engineer.

Mr. S. S. Kochak

MR. R. S. MILLER, Acting Chief Civil Engineer, Victorian Government Railways, has been appointed Chief Engineer of the Railway Construction Branch of the Board of Lands and Works. He will be responsible in the main for the supervision of the building of the Melbourne Underground Railway.

Industrial

MR. C. E. G. NYE, is retiring from the board of George Cohen Sons & Co. Ltd.

MR. FRANK SHUTT has been appointed Financial Comptroller to Hawker Siddeley Industries Limited.

MR. W. H. SHARP, Managing Director, Thomas Smith & Sons (Rodley) Ltd., is leaving on September 30 for a visit to South Africa, Australia, New Zealand, Singapore, Malaya, and India. Mr. Smith hopes to return to this country in December.

MR. F. D. STICKLAND, Commercial Director, is retiring from Vickers-Armstrongs (Shipbuilders) Limited, on March 31, 1962.

MR. W. A. TILL, Commercial Manager, Vickers-Armstrongs (Engineers) Limited, Barrow Works, has been appointed to succeed Mr. Stickland, and MR. W. J. SCOTT, Commercial Director, George Mann & Co., Ltd., has been appointed to the position.

The following appointments have been announced by Vickers-Armstrongs (Engineers), Limited, with effect from October 1, 1961 : MR. R. F. W. KEAY to be an additional member of the Board & Director of Production Engineering; MR. P. D. SCOTT MAXWELL, D.S.C., to be a Special Director & Deputy General Manager, Barrow Works; MR. J. HAY, to be a Special Director & Works Manager, Barrow Works.

To ensure more effective representation in England and Wales, some of the area representation of Wild-Barfield Electrical Furnaces Limited, has been re-arranged. The areas affected are: *Birmingham & East Midlands:* Area Manager to be MR. G. W. HAINES, and Sales Engineers to be MR. R. E. BUTCHERS and MR. C. A. MCNEILL. *West Midlands:* Sales Engineer to be MR. A. V. SKELSEY. *S. Wales:* Sales Engineer to be MR. T. M. MORGAN. *Sheffield & North Midlands:* Area Manager to be MR. E. J. HEISER, and Sales Engineers to be MR. D. N. GREENSMITH and MR. D. J. SUTHERLAND. *Northern England:* Sales Engineer to be MR. R. FLANAGAN.

Obituary

We regret to record the death, at the age of 59, of MR. W. CUTHBERT, Branch Manager, Newcastle, Thos, Cook & Son Ltd.

We regret to record the death, on August 12, of MR. J. B. CHADWICK, formerly Assistant Estate & Rating Surveyor, Euston, British Railways, London Midland Region.

We regret to record the death, on September 22, of MR. S. T. CLAYTON, who was, until his retirement in 1958, Motive Power Superintendent, Euston, British Railways, London Midland Region.

NEW EQUIPMENT *and Processes*

HEAVY-DUTY CONVEYOR

The Rolamat heavy-duty conveyor is simple to install and the low initial cost of standard units permits its use for a variety of transport and storage applications.

The basic assembly consists of a length of light alloy channel fitted with a series of 1-in. dia. free-running rollers, the roller pitch being 3 in., 6 in. or 12 in. as required by the loading conditions. For heavy-duty applications, a light-alloy roller is used, fitted with grease-packed needle-bearings and mounted on a hardened steel spindle. Maximum load capacity is 500 lb. and the co-efficient of friction is 0·015. For lighter duties the roller is made in linen reinforced Bakelite embodying graphite lubrication and running on a stainless steel spindle. This has a friction co-efficient of 0·05, and a load capacity of 200 lb. Running on a metal surface the effort required to move a load of 1,000 lb. is 40 lb. with the Bakelite roller assembly and 15 lb. with the light-alloy type.

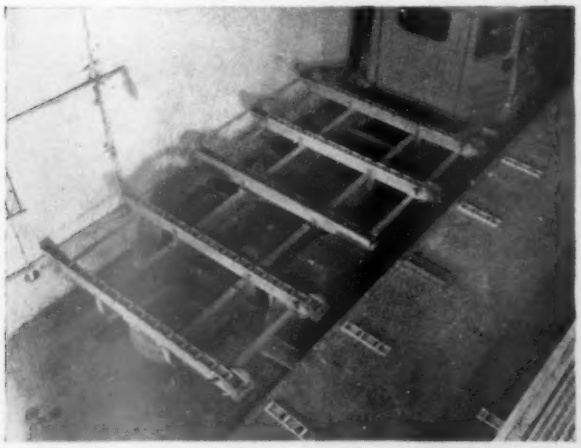
At the Cardiganshire Farmers Depot at Aberystwyth outstanding economies in time and cost have been effected in vehicle loading and unloading as a direct result of a handling scheme based on the use of Rolamat assemblies. At this depot, where conditions are very congested, lorry turn-around time has been cut from approximately 1½ hr. to 7 min. For the pilot scheme one lorry has been provided with two light-alloy demountable bodies supplied by Alfred Miles Limited. Lengths of Rolamat are bolted to the timber cross-bearers on the chassis, and matching Rolamat tracks are bolted to the top of the loading deck.

An empty lorry arriving at the depot is driven into a bay alongside the deck, a shallow recess in the floor, for the front tyres serving to align the roller tracks on the vehicle with the tracks on the loading bay. Quick-action hinged clamps on the chassis are released and the body slides sideways off the chassis on to the matching tracks in the loading deck. Guide plates on the centre track ensure correct tracking of the skids on the underside of the body, and body transfer is a one-man operation.

The truck then draws out and is reversed with the loading bay on the opposite side of the deck. Vehicle positioning here is effected by two cone-shaped attachments at the rear of the chassis. These engage in a socket on the end wall of the bay, providing correct longitudinal alignment with the roller tracks. Engagement of the cones into the socket gives an initial compression of the vehicle springs and holds the chassis frame at the correct height when the load is applied.

On the deck is a loaded body and by the use of a hand-operated cable winch the body is slid off the deck on to the chassis. Horizontal tape locating pins on the body engage with locating sockets in stop brackets on the frame, and operation of the quick-action clamps securely anchor the body to the chassis. Two jacks are used to hold the front end of the chassis at the corrected height during the body transfer operation. These are hydraulic jacks for quick operation, conveniently hinged to the sides of the loading bay. The time taken for the complete operation between arrival and departure of the vehicle is seven minutes.

End removal and loading of the bodies



is the preferred method but side loading was necessary with this installation owing to site conditions.

An application designed for pallet-type loading of road and rail vans has been carried out by Welded & Allied Products Limited. In this the van floor is divided into a number of sections, each fitted with retractable Rolamat units running longitudinally and/or transversely in the van. The roller assemblies are laid in shallow channels fitted with inflatable rubber tubes. During loading or unloading the roller tracks are raised by air pressure slightly above floor level, the exact amount of lift depending on the direction of pallet movement required. Release of the air pressure when the loading of each section is completed retracts the roller tracks and allows the load to rest on the floor of the van. The air supply at 15 p.s.i. is provided by an air bottle or portable compressor set.

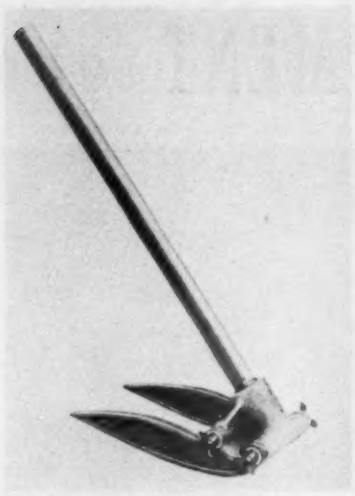
Further details may be obtained from Armstrong Whitworth Equipment, Hucclecote, Gloucester.

FLOORBOARD LIFTER

The three Delway-Rapid floorboard-lifting devices illustrated on this page comprise lifters for small and large areas and a foot-operated board tongue cutter.

The Model "A" standard lifter handles boarding up to 6 in. wide, the Model "B" up to 10 in. wide. Both models allow boards to be removed and replaced without damage; permit room-spanning boards to be lifted and cut cleanly at joist centres; will not mark adjoining boards and, while weighing less than 3 lb., can lift up to 2 tons.

The large-area lifter also lifts boards with minimum damage to the wood. It is designed for quick blade-reversal to allow removal of boards close to walls.



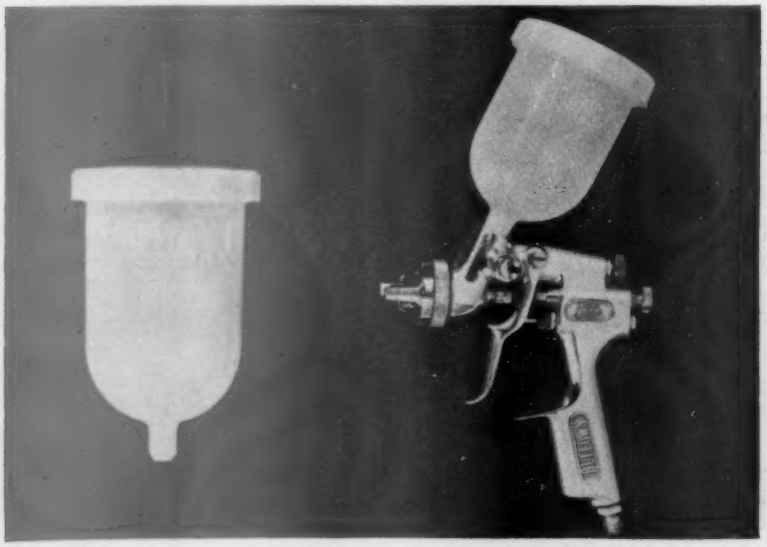
Its tubular handle is completely insulated with plastic to prevent injury to the operator in the event of the accidental shearing of an electric cable.

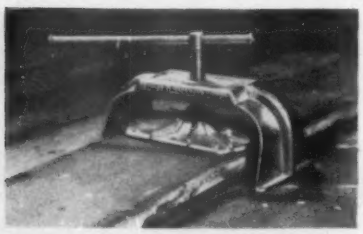
The tongue cutter incorporates a blade made from hardened and tempered tool steel: there are no teeth to blunt or break. Side rollers limit blade penetration so that joists and underfloor services cannot be damaged, and the whole cutter rides up and over hidden nails. Automatically braked by contact between the operator's heel and the floor, the cutter cannot run away.

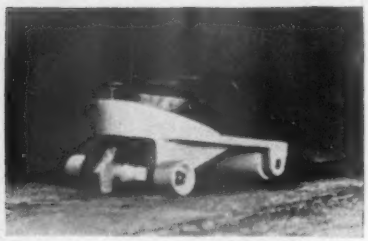
Further details can be obtained from the manufacturer, Explosive Power Tools Limited, Hope Street, Dukinfield, Cheshire.

NYLON CUPS FOR SPRAY GUN

Two nylon cups are available for use with the Bullows L600 top feed spray gun. Catalogue numbers are L81 and L82, with capacities of ¾ pint and 1½ pints respectively.







The cups weigh only 2¼ oz. and 4½ oz., and therefore allow greater freedom of movement and considerably reduce operator fatigue. They are impervious to attack by most known solvents and will not dent. Both cups have screw-on nylon lids incorporating a sealing device which obviates the need for lid gaskets.

Further details can be obtained from the manufacturer, Alfred Bullows & Sons Ltd., Long Street, Walsall, Staffordshire.

IN-LINE AUTOMATIC LOADER

An in-line type of automatic loader permitting a straight line flow of gears through a conventional rotary gear-shaving machine has been developed and is to be marketed in the United Kingdom. It makes available a further method of automatically processing gears through a shaving machine on automated lines. The new method feeds gears in a straight line across the machine or through a battery of machines. It also allows automatic handling of larger diameter gears.

Further details can be obtained from Precision Gear Machines & Tools Limited, Red Ring Works, Bodmin Road, Coventry.

PORTABLE CUTTING MACHINE

The Pug—a portable lightweight oxygen cutting machine—weighs only 21 lb., cuts and bevels steel up to 2 in. thick, and costs under £40. Running on inexpensive light-alloy track, it can make a straight cut of any length. Circles from 2 to 45 in. in diameter can be cut with the use of an adjustable trammel attachment. Power is by a universal electric motor suitable for a.c. or d.c. at voltages of 220/240 or 110 and with a maximum consumption of 80 W.

Further details can be obtained from the manufacturer, the British Oxygen Co. Ltd., Bridgewater House, St. James's, London, S.W.1.

International Union of Railways

60th session of board of management in London, September 26, 1961

A detailed article on the organisation and the main activities of the International Union of Railways (U.I.C.) was published in our issue of September 22, 1961.

This article gives some complementary information concerning the most recent work of the board of management which is composed of the General Managers of 14 large European railways administrations, meeting under the chairmanship of Mr. John Ratter, Member of the British Transport Commission.

New U.I.C. H.Q. in Paris

The board of management was informed of the current position with regard to the building of the new headquarters, which will be ready to house the U.I.C. general secretariat in about two years' time: the foundations are finished and the work has started on the actual building.

After considering the conclusions of the report drafted by Mr. Cuttica, Chairman of the special committee on automatic coupling, the board of management was of the opinion that it would be too expensive to endeavour to introduce a full buffing and draw automatic coupling in the first instance. The General Managers consequently decided that a simple traction automatic coupling should be adopted in the relatively near future, enabling the side buffers to be retained and the coupler head of the system to be used subsequently in a full buffing and draw coupler. At this stage of the study, the point of view of the operating department with regard to the introduction of automatic coupling had become very important and it was in the province of that department to consider in detail the problems which would arise during the transition from the present coupling system to the automatic system.

U.I.C. technical committees

The board of management was informed of the decisions taken, on the one hand, by the 1st and 4th committees (passenger traffic and operating) during their joint meeting held last April and, on the other hand, by the technical committees (operating, motive power & rolling stock, way & works) which held their session in May. It approved the programme of work of these committees for the coming year.

Among the many questions being studied are those concerning the future of passenger traffic and improvements in the forwarding of goods. Progress has been made in connection with the standardisation of passenger carriages, and of certain types of goods wagons. Progress had also been made with the regulation for the conveyance of road vehicles in wagons and the wide application of technical specifications for the supply of railway equipment.

A memorandum was submitted by the 6th committee which followed the report entitled "Outline of a policy for the co-ordination of infrastructure investment in transport," drafted by that committee in 1960. Arguments were developed which were intended to overcome objections which might be raised to passages in this report recomt mending the setting up of a separate fund for each means of communication which is not owned by the user.

The board of management approved the 6th committee's programme of work which included a new question: study of the financial assistance granted to airlines.

1st, 2nd and 3rd committees

These committees cover passenger traffic, goods traffic and finance, accountancy & statistics and the list of new questions proposed by the committees for inclusion on the programme of work was approved by the board.

The board of management was given details of the meetings of heads of motive power and rolling stock departments and of heads of operating departments held respectively in Zurich on July 3 and in Milan on September 11 and 12, during which attention was paid to the major studies at present undertaken by the U.I.C. and in particular the standardisation of specialised goods rolling stock, the wide ruse of roller-bearing axleboxes, the study of bogie wagons and automatic coupling.

Details of the distribution of the report on the economic problems of the railways of member countries of the European conference of Ministers of Transport were given and of the steps taken to make known the views held by the railways which are stated therein.

The Secretary-General gave brief details of the more important international activities in which the U.I.C. participated since the last session of the board.

The session ended with a dinner on board r.m.s. *Arlanza* (by courtesy of the Chairman and Directors of the Royal Mail Lines Limited) and in addition to the Members of the board of management and their ladies. The guests included the Chairman of the B.T.C., Dr. Richard Beeching and Mrs. Beeching, Sir John and Lady Benstead, Mr. and Mrs. A. B. B. Valentine, Mr. and Mrs. C. P. Hopkins, Mr. and Mrs. H. C. Johnson. Sir Gilmour and Lady Jenkins, Mr. and Mrs. Stancliff and Mr. and Mrs. Matthews represented the Royal Mail Lines Limited. Captain Bolland, Master, supported by Mr. and Mrs. Ratter and Sir Gilmour and Lady Jenkins welcomed the guests on board.

The 60th session of the International Union of Railways board of management in London on September 26, 1961

One of the 586 propane-gas point heaters to be installed in the North Eastern Region

Use of point heaters in the North Eastern Region

To eliminate winter-time delays to trains caused by points becoming frozen or blocked by snow, the North Eastern Region of British Railways is to install 586 point heaters at important junctions on the East Coast main line.

Experiments were carried out last winter and from these a point heating unit has been developed easily fitted to the rails and effectively melting snow and ice.

The unit comprises two assemblies, each consisting of a gas-and-air-mixer unit connected to 1 in. galvanised pipe to which are fixed five radiant elements facing into the web of the stock rail, one to each of the first five bays behind the switch toe. Normally, the mixer is fitted at the opposite end to the point toe and the assembly is held by coach-screw clamps on the sleeper ends. Both mixers are coupled by ½-in. p.v.c. piping from a common feed and carry propane at a pressure of 14·7 lb. per sq. in. A shield fitted over the mixer collects warm air from the first element to increase burning efficiency.

A unique radiant element, is incorporated in the Mills-Arma switch heater, manufactured by James Mills & Exors. Ltd. The mixed gas ignites in front of a ceramic honeycomb block which, as it warms, moves the combustion area back into the block itself, thus providing a source of infra-red heat and forming a perfect screen to prevent the burning gas from being blown out.

Noteworthy features of this system are its compactness and neatness. Fitting is done in a matter of 10 to 15 min., simply by attaching two brackets held by coach screws and attaching the assemblies and gas-supply piping.

To feed the point heaters on the lines north of York, a 5 -ton capacity storage tank has already been installed at the motive power depot, while other tanks of five- and two-ton capacity are planned to feed the point heaters to the south. Bulk-storage tanks of 10-ton capacity will feed the point heaters at Darlington and Newcastle.

Before the installation of these heaters, severe weather conditions in York alone could lead to some 200 to 240 men being taken off other work and employed in shifts, day and night, throughout the period of the emergency. With the gas heaters, only 24 men will be needed and what is more important, all the points will be kept continually clear and free moving.

It is expected that all the heaters will be installed before the onset of wintry conditions this year. Experiments are continuing to find the most suitable type of gas-supply system for use on the Tyneside electrified lines.

Institute of Transport awards

Mr. James Amos, Chairman, Scottish Omnibuses Group, will deliver his Presidential Address to the Institute of Transport at the Inaugural Meeting of the 1961-62 Session, to be held on October 9, in the Jarvis Hall of the Royal Institute of British Architects, 66, Portland Place, London, W.1.

Awards for 1960-61

The Institute of Transport Award of Merit is to be given to Air Chief Marshal the Hon. Sir Ralph Cochrane, formerly Vice-Chief of Air Staff, now of Rolls-Royce Limited, for his 1961 Brancker Memorial Lecture on "Aviation—the next stage?" The Award of Merit, which is presented not more frequently than once in three years to a member in recognition of a conspicuous contribution to the promotion of the knowledge of transport, takes the form of a bronze statuette of Pegasus.

The Institute of Transport has also announced the following awards for papers submitted during the 1960-61 Session and in respect of successes at the Institute of Transport examinations held in May, 1961 :—

British Transport Commission Awards:—

Mr. S. A. Finnis, Chief Docks Manager, Southampton & Plymouth, British Transport Docks, for his paper on "The handling of freight traffic between ship and shore."

Mr. C. R. Bennett, Divisional Traffic Manager, Liverpool, British Railways, London Midland Region, for his paper on "The traction unit in railway modernisation."

Mr. L. James, Chief of Police, Eastern Area, British Transport Police, for his paper on "The work and problems of the B.T.C. Police."

Mr. R. B. Meadows, Traffic Costing Officer, British Railways, Eastern Region, for a meritorious performance in the Associate Membership Examination.

Road Transport (Passenger) Medal:—

Mr. L. C. Hawkins, Member, London Transport Executive, for his paper on "Mass transportation in the future."

Institute Associate Membership Examination Prizes:—

Prize for first place to Mr. A. P. Fleming, Traffic Superintendent, Southern Routes, B.O.A.C.

Prize for second place to Mr. S. H. Watson, Relief Station Master, British Railways, Western Region.

Institute Graduateship Examination Prize:—

Prize for first place to Mr. D. S. Hellewell, Junior Technical Assistant, Chief Civil Engineer's Department, British Railways, North Eastern Region.

British Railways Research H.Q. and Laboratories at Derby

The British Transport Commission has placed a contract for the construction of the buildings for British Railways' £1¼ million engineering laboratories and Research Department Headquarters in London Road, Derby. Work is about to begin and will take some two years to complete. The new group of buildings has been designed by the Commission's Architect, Mr. F. F. C. Curtis.

The biggest building in the group will be a flat-roofed five-storey administration block housing scientists' study rooms, a library and offices, and, at the west end, a large equipment test-hall some 200 ft. square. The whole group of buildings will have a total floor area of about 100,000 sq. ft. and will occupy some 85,000 sq. ft. of ground.

The administration block will be constructed of reinforced-concrete framing with window-glazing units set between the concrete frames. Beneath the window sills the sides of the building will be faced with opaque white vitreous panels. The concrete frames will be faced with black aggregate.

Main test-hall

The main test-hall at the far end of the site, which will be about 40 ft. in height at the eaves, will have blue-grey brick walls up to 19 ft. above ground level. Above this the rest of the building, including the flat roof with seven projecting north lights, will be a steel-framed structure clad completely in glass to give the maximum natural lighting.

The entrance to the group of buildings will be protected by a concrete awning set in the centre of the front of the administration block. Opposite the entrance will be a car park. At the rear of this block there will be a paved and landscaped quadrangle enclosed on the other three sides by single-storey laboratories of the same construction with similar black and white facings. The laboratory wings to the left and right of the quadrangle will extend forward alongside the ends of the administration

block so that the five-storey building lies between the ends of the wings.

On the far side of the laboratory building an extension will connect the laboratories with the test-hall. As well as linking the test-hall with the rest of the group the extension will also accommodate an instrumentation store, staff amenities, and, beneath it, a boiler house. The boiler house chimney, sited on the London Road side of the extension, will be clad with aluminium to reduce maintenance costs.

Within the laboratory sections there will be mullions at 6-ft. intervals, an arrangement which will give a high degree of flexibility as the sizes of the various laboratories will be variable by multiples of this spacing. The main services—electricity, gas, water, and heating—will be conducted in "walk-through" ducts beneath the laboratories to give service engineers easy access when changes in the supply are needed.

This section will contain a wide variety of laboratories equipped for studies of physics, heat, acoustics, light, metallurgy, and metalography. There will also be instrumentation and photographic laboratories, a drawing office, and special rooms for computers. The large test-hall will include a heavy dynamic fatigue-testing installation for experiments with bridge girders, underframes and concrete units, a static 250-ton compression machine for testing carriage underframes, and vehicle inspection pits. It will also contain a special area where tests on small components can be carried out, a stores room and a workshop.

CONTRACTS & TENDERS

The British Transport Commission has placed a contract with William Moss & Sons Ltd., Loughborough, for the construction of the buildings for British Railways' £1½ million engineering laboratories and research department headquarters in London Road, Derby. The work is expected to take about two years to complete.

British United Traction Limited has received an order from British Railways for 20 sets of traction equipment to be installed in new Western Region multiple-unit diesel sets. Each set of equipment comprises a pair of B.U.T. 230 b.h.p. horizontal diesels and S.C.G.-type S.E.4 gearboxes and RF28 reversing final drives, together with control equipment. Additionally, 20 sets of non-driving trailer-car equipment are included in the order.

Brush Electrical Engineering Co. Ltd. has received an order from the British Transport Commission for a further ten Type 2, 1,365 b.h.p. diesel-electric locomotives, to be delivered early in 1962. The diesel engines will be Mirrlees JVST 12-cylinder units, fitted with HSBT turbo-chargers. Earlier this month, 14 similar locomotives were ordered for the Rhodesia Railways.

Usines Emile Henricot, of Court St. Etienne, Belgium, has received an order from the Indian Railways for 400 Atlas Universal transition-type automatic couplers and 2,186 Atlas IR couplers, the stated prices being Belg.Fr. 8,370,000 and 33,227,200 respectively.

Sumimoto Metal Industries, Japan, has received from the Indian Railways an order for 15,000 broad-gauge wheel sets to suit 16-ton axle load and plain-bearing axleboxes.

A/S Scandia has received from the Danish State Railways an order for ten main-line passenger coaches to be fitted with the Minden-Deutz form of bogie; and also an order for 100 of the Seag type of fixed-roof sliding-side freight wagons for delivery by the end of 1962, and similar to ten supplied by Seag to the D.S.B. in 1960.

British Railways, London Midland Region, has placed the following contracts:—

Arundel (Contractors) Limited: cleaning and painting of Liverpool Exchange Station;

W. D. Randall (Hartshill) Limited: new signalbox at Nuneaton;

Truswell & Son Ltd.: installation of steam heating in Millwrights Shop at Locomotive Works, Crewe;

Kelsey Roofing Industries Limited: repairs to roofs over repair shops at Generating Station, Stonebridge Park;

James Carmichael Limited: alterations and redecoration at St. Pancras Chambers to form new office accommodation for London (Midland) Divisional Traffic Manager.

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Formosa :

Axles for locomotives, TRA drg. No. 1-354, materials to be conformed with specification JIS-SFA55 or ASTM designation A236-52T, classes D or G: 4 A145, 10 A155, 1 A175, 3 A180, 10 A185, 15 A205, 6 A210, 3 A212, 4 A225a, 1 A234, 30 A 236, 6 A245, 2 At165, 30 At175, 4 At180a, 40 At180b, 2 At195

30 sets wheel and axle of type 12-ton long axle, Drg. No. DVB4105

20 sets wheel and axle with roller bearing for TP32700 type passenger car, Drg. No. TXPR13189, TXPR13192

4 sets wheel and axle with roller bearing for SP32700 type passenger car, Drg. No. DA17156, DA16548-3

120 solid wheel for TP32600 type passenger car, Drg. No. PC8999.

The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan, to which bids should be sent. The tender No. is GFA-10652, The closing date is October 17, 1961. The Board of Trade reference is E.S.B./30338/61.

From Pakistan :

Mild-steel sheets, galvanised, corrugated, special quality to S. & D. specification No. G/Metal/7

46 ton, 14 cwt. 9 ft. x 2 ft. 8 in. x 18 S.W.G.

472 ton 10 ft. x 2 ft. 8 in. x 18 S.W.G.

The tender No. is PZ/GB4/62/61/ACST. The closing date is October 9, 1961. The Board of Trade reference is E.S.B./29993/61

13,000 cwt. pig iron, standard foundry No. 3 coke quality

The tender No. is PZ/GB4/173/61/ACST. The closing date is October 11, 1961. The Board of Trade reference is E.S.B./29991/61.

280 cwt. copper rounds annealed 1½ in.

100 cwt. copper rounds annealed 1⅝ in.

171 cwt. copper round bars annealed 1 in.

The tender No. is PZ/G24/90/61/ACST. The closing date is October 10, 1961. The Board of Trade reference is E.S.B./29989/61.

1,500 cwt. bronze ingots, PRSS No. N-9-49 class II

5,500 cwt. copper ingots, PRSS No. N-4-49

1,760 cwt. lead pig S. & D. specification No. G/Metal/33

The tender No. is PZ/GB4/179/61/ACST. The closing date is October 10, 1961. The Board of Trade reference is E.S.B./29992/61.

The issuing authority for the above tenders is the Chief Controller of Stores, Pakistan Eastern Railway, Pahartali, Chittagong, to whom bids should be sent.

38 tons refined tin ingots.

The issuing authority is the Chief Controller of Stores, Pakistan Eastern Railway, Pahadtali, Chittagong, to whom bids should be sent. The tender No. is P2/GB4/178/61/ACST. The closing date is October 9, 1961. The Board of Trade reference is E.S.B./29990/61.

1,840 cwt. Calgon S.

The issuing authority is the Chief Controller of Purchase, Pakistan Western Railway, Empress Road, Lahore, to whom bids should be sent. The tender No. is P5/443-A1-1961. The closing date is October 12, 1961. The Board of Trade reference is E.S.B./29919/61.

From the Philippines :

1 complete 2-way radio-telephone system for station-to-station, station-to-train, and train-to-train communication, consisting of 14 base stations and 9 mobile stations.

The issuing authority is the Chief Engineer, Manila Railroad Company, Manila, to whom bids should be sent. The closing date is October 10, 1961. The Board of Trade reference is E.S.B./29952/61.

From Thailand:

400,000 mild-steel general-purpose electrodes 3·25 mm. dia. size no. 10 medium coating, tensile breaking strength 48-52 kg. per sq. mm., elongation 25-31 per cent, for horizontal, vertical, and overhead positions, a.c. and d.c.

The tender No. is 04324. The closing date is October 16, 1961. The Board of Trade reference is E.S.B./29816/61.

80,000,000 tickets, thick, orange, with design on one side

2,000,000 tickets, thick, white, with orange strip, plain

200,000 tickets, thick, white, plain.

The tender No. is 04332. The closing date is November 6, 1961. The Board of Trade reference is E.S.B./29739/61. The issuing authority for the above tenders is the Stores Section, State Railways of Thailand, Yod-Se, Bangkok, to which bids should be sent.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

British Transport Commission traffic receipts

The following tables show the British Transport Commission's traffic receipts for four-weeks ending September 10, 1961, compared with the corresponding period last year and the percentage variation 1961 compared with 1960.

PERCENTAGE VARIATION 1961 COMPARED WITH 1960

	Four weeks to Sept. 10	36 weeks to Sept. 10
British Railways—		
Passengers	+ 6·2	+ 3·8
Parcels	+ 0·7	+ 0·6
Merchandise & Livestock	— 6·9	—
Minerals	— 20·5	— 7·8
Coal & Coke	— 6·9	+ 0·6
Total	— 2·5	—
Ships, passengers	+ 17·2	+ 6·7
British Road Services, Inland Waterways & Ships (cargo)	+ 3·9	+ 8·2
Passenger Road Transport, Provincial & Scottish	+ 9·5	+ 5·9
London Transport—		
Railways	+ 8·1	+ 8·9
Road Services	+ 5·0	+ 3·8
Total	+ 5·9	+ 5·4
Aggregate	+ 0·6	+ 2·0

	Four weeks to Sept. 10 1961	Four weeks to Sept. 11 1960	Incr. or Decr.	Aggregate for 36 weeks to Sept. 10 1961	Aggregate for 36 weeks to Sept. 11 1960	Incr. or Decr.
	£000	£000		£000	£000	
Passengers—						
British Railways	14,304	13,461	— 843	112,098	107,891	+ 4,207
London Transport—						
Road passenger services	4,651	4,429	+ 222	40,713	39,189	+ 1,524
Railways	2,162	2,000	+ 162	19,356	17,765	+ 1,591
Provincial & Scottish Buses	6,118	5,583	+ 535	46,105	43,532	+ 2,573
Ships	1,424	1,214	+ 210	6,410	6,007	+ 403
Total passengers	28,659	26,687	+ 1,972	224,682	214,384	+ 10,298
Freight, Parcels & Mails—						
British Railways—						
*Merchandise & livestock	7,107	7,637	— 530	69,130	69,063	+ 67
*Minerals	2,897	3,647	— 750	30,685	33,303	— 2,618
*Coal & Coke	7,286	7,834	— 548	70,881	72,503	— 1,622
*Parcels, etc., by coaching train	4,426	4,394	+ 32	38,565	38,319	+ 246
†Others	5,008	4,819	+ 189	43,785	40,453	+ 3,332
Total freight, parcels & mails	26,724	28,331	— 1,607	253,046	253,641	— 595
Total	55,383	55,018	+ 365	477,728	468,025	+ 9,703

* Includes receipts from collection and delivery, etc.
† Receipts from railway movements wholly within dock areas, included in previous periods under "Freight, Parcels and Mails," are now classified as miscellaneous.

NOTES AND NEWS

French winter train services. In our editorial article last week on French winter train services we stated that the first-class-only 8 p.m. from Paris to Le Havre would start from Paris St. Lazare at 7.33 p.m. and arrive at Le Havre at 8.28 p.m. This latter time should be 10.03 p.m.

Naming of diesel locomotive. On September 23, Major-General C. B. Fairbanks, Colonel of the Sherwood Foresters, officiated at a ceremony at Derby Station when the regimental name and crests were transferred from steam locomotive No. 46112 to diesel locomotive No. D100. The illustration shows Major-General Fairbanks and Mr. R. L. E. Lawrence, Line Traffic Manager, Derby, British Railways, London Midland Region, examining a model of the locomotive after the ceremony.

Major-General C. B. Fairbanks, with a model of the Sherwood Forester

Steel mill output. Output from the Lackenby Universal Beam Mill of Dorman Long (Steel) Limited which began commercial production in 1958 now exceeds a million tons.

Accident prevention. The British Safety Council is to organise courses for foremen to train them in safety measures that prevent accidents in industry. The courses will last 4½ days and will be followed by an examination.

R.B.I. annuities and grants. At its meeting on September 18, the Railway Benevolent Institution granted annuities to three members involving an additional liability of £75 a year. To meet cases of immediate necessity 245 gratuities were granted amounting to £2,530. Grants made from the Casualty Fund during the months of July and August amounted to £972.

Optoshield Limited move to Watford. Optoshield Limited has moved its production and development departments to Watford. The Sales Department and Head Office remain at 146, Clerkenwell Road, London, E.C.1.

Collision at level crossing. One man was killed and three injured when a motor car was in collision with a train at an open level crossing at Hythe, near Southampton, on the Southern Region of British Railways, on September 17.

Legislation for Canadian railway. The Canadian House of Commons has given a first reading to legislation to build a 438-mile railway from Grimshaw, Alberta, to Pine Point. This railway will provide transport for the deposits of lead and zinc in the Pine Point area.

Special train to Blackpool. The London Midland Region of British Railways is to run a special train from Retford to Blackpool for employees of the Northern Rubber Co. Ltd., on September 30. For those employees unable to travel on it the company is offering a prize of £10 for the best photograph of the train *en route*.

Southern Region services disrupted. Train services were disrupted at Croydon on the Southern Region of British Railways on September 8, when a perambulator chassis thrown on the line short-circuited current and caused a fire on the embankment.

Collision on the Brighton line. Two trains were in collision outside Brighton Station on September 19. The 11.28 a.m. from Victoria

ran into the side of an empty coaching-stock train and the consequent derailment blocked two Down lines just before 1 p.m. but nobody was hurt. There was considerable reaction on other services throughout the day.

Midge Hall Station to close. Midge Hall Station, between Preston and Liverpool Exchange, on the London Midland Region of British Railways, is to close for all traffic on October 2.

Goods depot closure. Burslem goods depot, between Hanley and Tunstall, on the London Midland Region of British Railways, is to close for all traffic on October 2.

Opening of moulding plant. A battery-container moulding plant costing £500,000 has been opened at Little Lever by United Ebonite & Lorival Limited.

Company formed. A company has been formed to operate a newly opened diesel fuel-injection equipment factory in France. The capital of the company, Roto Diesel S.A., is held jointly by C.A.V. Limited and the French group of companies, the D.B.A. Group.

C.N.R. simplified ticket system. The Canadian National Railways is to introduce nine simplified tickets to replace 200 now issued. It is expected that the result of this innovation in the ticket system will be speedier ticket issue, easier collection, and simplified accounting.

Clutch and brake company. A company entitled Witchita United Limited, has been set up to manufacture and market clutches and brakes. The address is Basildon Industrial Estates, Essex, and the telephone number is Basildon 20421.

Computer components and equipment. At the Electronic Computer Exhibition, 1961, the Data Recording Instrument Co. Ltd. will show two digital tape transports programmed to simulate actual working conditions. Other exhibits will include analogue equipment and magnetic drum unit for G.P.O. use, as well as a selection of high-quality recording heads.

Measuring instruments on show. At the Brno International Trade Fair (September 10-24), the Cambridge Instrument Co. Ltd., with its associates, Electronic Instruments Limited, are showing a selection of instruments manufactured by both companies. These will include pH recorders and indicators and instruments for measuring many widely-differing phenomena. A new hydrogen in metals analyser will also be on display.

Production control conference. A conference, arranged by the Willesden & Hendon Productivity Association under the auspices of the British Productivity Council, is to be held at the Federation of British Industries, 21, Tothill Street, London, S.W.1, on November 22. The theme of the conference will be "Production control as a means to higher productivity," and the admission fee will be 3 guineas.

Ceiling material on London Underground. Waerrite yellow finaweave veneer is being tried as ceiling lining by the London Transport Executive. The illustration shows the material in place above the escalator at Moorgate Station.

New ceiling at Moorgate Underground Station

Co-ordination of Canadian Pacific services. Canadian Pacific has co-ordinated its handling of all express rail and air services, air freight, and less-than-full loads by rail into one operation in the provinces of Quebec, Nova Scotia, and New Brunswick. Central offices will handle calls for all types of services and send one vehicle to collect any class of traffic. Ultimately it is hoped to introduce centralised invoicing procedure.

Increase in passengers to the Continent. The Southern Region of British Railways' "no-passport" trips to the Continent have catered for 30 per cent more passengers since Easter than for the same period last year. The car ferries across the Channel have carried more passengers too, as have also the Channel Islands and the Isle of Wight services.

Withdrawal of services in Scotland. The Scottish Region of British Railways is to withdraw over 130 trains on 20 main and branch lines in Scotland within the next eight weeks. Consideration is also being given to the withdrawal of passenger services on the inner and outer circle at Edinburgh, and the Edinburgh Rosewell and Edinburgh-Leith lines.

Diesel engineers annual general meeting. The annual general meeting of the Diesel Engineers & Users' Association will be held at the Institute of Marine Engineers, Mark Lane, London, E.C.3 at 2.15 p.m. on October 19. An ordinary meeting will follow at which three papers on reclaiming worn or damaged parts of diesel engines will be given. The papers will be by Mr. J. Oswald, Mr. A. Tinwell and Mr. N. G. Young.

International railway swimmers. The inter-regional men's swimming competition was held by British Railways at Cardiff on September 20. Twelve men were selected to represent England at the International Railwaymen's Swimming Championship to be held at Blackpool on October 6 and 7.

Visitors to Britain in July. Overseas visitors to Britain during July increased by 9 per cent over July last year and brought the total for the first seven months of this year to 1,112,660, an increase over last year of 12 per cent.

Borough Polytechnic courses. The Borough Polytechnic is to run a course of ten lectures on "Refractories, their manufacture, properties, and uses"; a course of eight lectures on the "Metallurgy of semi-conductors," and a course of six lectures on "Modern methods of non-destructive testing of metals," all of which will commence in October.

Railway enthusiasts' meeting. The Railway Enthusiast's Club is to hold two meetings in October to which non-members will be welcomed. They are, at the Railway Enthusiasts' clubroom at Farnborough, on October 7 at 7 p.m. "Transport Journalism," a talk by Mr. W. T. Lambden, and at Brunswick Club, 30, Wandsworth Road, London, S.W.8 on October 18 at 7.45 p.m., a demonstration of the various stages in the preparation of railway coats of arms by Mr. R. E. Vincent.

Smiths make news. This is the title of a publicity film made for Thomas Smith & Sons (Rodley) Ltd. and shown for the first time last week. The 16 mm. colour film runs for 30 min. and shows the diverse range of cranes and excavators manufactured by Smiths at work under typical operating conditions. Copies of the film are available from the publicity department and foreign language copies are being prepared for distribution overseas.

1962 Cruise plans. The London Midland region of British Railways has announced that the Continental and Scottish cruises by ss. *Duke of Lancaster* will operate again next year. There will be two Scottish cruises

in the Spring and one in the Autumn. There will be two 12-day Spring Continental cruises. Other Continental cruises next year in addition to Amsterdam, will include calls at Kristiansand, Oslo and Copenhagen, via the Kiel Canal.

Closing of stations. Horbury (Millfield Road) Station, on the Mirfield-Wakefield line of the North Eastern Region of British Railways, will be closed on November 6.

Metallurgical company's plant. Henry Wiggin & Co. Ltd. conducted 20 of its overseas agents on a tour of its recently opened plant at Hereford from September 25 to 27.

New British Railways vessel. The British Transport Commission has ordered a 7,000-ton passenger ship for the Harwich-Hook of Holland night service of the Eastern Region of British Railways. This will be the largest ship on British Railways cross-channel service and will be built by Alexander Stephen & Sons Ltd. of Glasgow.

Southern Region film coach. A cinema car was in service for the first time on the Southern Region of British Railways on September 14 when a party of motoring, agricultural, and engineering journalists travelled from Waterloo to Southampton to see a demonstration by a Mercedes tractor on the Beaulieu estate of Lord Montagu. Colour films illustrating the capacities of the tractor for municipal work, forestry, farm work, snow clearance, and haulage were screened.

Southern Region Lecture & Debating Society. British Railways, Southern Region, Lecture & Debating Society will open its 33rd Session with an address by Mr. J. MacNaughton Sidey, Member of the Southern Area Board of the British Transport Commission, on " The unit loading of Sea freight, Mr. C. P. Hopkins, General Manager, Southern Region, will be in the chair. Among the subjects for discussion during this session are " Some thoughts on railway organisation," by Mr. D. S. M. Barrie, on December 13; " Some electric traction developments," by Mr. W. J. A. Sykes, Chief Mechanical & Electrical Engineer, Southern Region, on January 3, 1962, and " Motive Power and the modernisation plan", by Mr. G. A. Weedon, Line Traffic Manager, Central Division, Southern Region, on February 28, 1962.

Revised British Standard. The new edition of B.S.456—dimensions of track circuit insulation—has revised and superseded the 1932 version. It has taken into account the "A" size rails and specifies the dimensions of track circuit insulation for all rail sections above 85 lb. per yd. bull-head, and 70 lb. per yd. flat-bottom, as specified in the appropriate British Standard. The specification now includes solid insulating fishplates, and synthetic resin-bonded fabric has been listed as suitable insulating material. An appendix gives information on the rail insulations for superseded rail sections. Other appendices give guidance on the modifications to be made to end posts in order to reduce the effect of metallic dust, and the information to be supplied with inquiry and order. The standard is illustrated by 35 figures. Copies of this Standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 12s. 6d. each. (Postage will be charged extra to non-subscribers.)

Railway Stock Market

Among foreign rails, following publication of the annual report, a little profit-taking put Antofagasta ordinary stock down to 18, compared with 21 a week ago, though the preference stock remained at 36.

Chilean Northern 5 per cent first debentures lost a point at 48, while Costa Rica ordinary stock remained at 38½, and Brazil Railway bonds at 3⅞. Mexican Central " A " bearer debentures were 58 and San Paulo Railway 3s. units 2s. 0¾d.

Paraguay Central prior debentures changed hands at 17¼, while in other directions, Guayaquil & Quito assented bonds were 58½. International of Central America common stock kept at $15½, but the preferred receded from $91 to $87. Midi 4 per cent sterling bonds was quoted at 80. West of India Portuguese capital stock was 120½ and Barsi Light Railway stock marked 16.

Reflecting the trend of Wall Street, Canadian Pacifics have receded on balance from $44⅛ to $43⅛; the 4 per cent preference stock kept at 54½, and the 4 per cent debentures at 53½ were virtually the same as a week ago. White Pass shares have been firmer at $10⅞. Midland Railway of Western Australia £1 units of second debenture stock were quoted at 11s. Nyasaland Railways ordinary shares were also 11s. with the 3½ per cent debentures 32.

Outstanding feature in the locomotive engineering and kindred section has been activity and strength of Birmingham Wagon shares, which compared with a week ago advanced from 22s. 6d. to 31s. 6d. because of a revival of talk of take-over possibilities and estimates of the value of the company's property assets. North British Locomotive were again 5s. 3d. and G. D. Peters 16s. 10½d. but a good feature was a rise in Wagon Repairs 5s. shares from 22s. 6d. a week ago to 23s. 9d., buying of the shares being attributed to wider recognition of the strong balance-sheet position. Gloucester Wagon 10s. shares, however, eased from 10s. 1½d. to 9s. 9d., but Beyer Peacock 5s. shares at 6s. 4½d. were virtually unchanged compared with a week ago, and Charles Roberts 5s. shares at 5s. 4½d. were maintained on balance, though elsewhere, Westinghouse Brake shares fell sharply to 29s. 9d. (compared with 32s. 3d. a week ago).

In electricals, A.E.I. have fallen back from 37s. 3d. to 35s. under the influence of the half-yearly statement which warned shareholders that it may not be possible to keep the year's dividend at 15 per cent. G.E.C. at 26s. 9d. compared with 29s. a week ago, and English Electric fell 1s. at 28s. Crompton Parkinson 5s. shares, however, have been quite well maintained at 12s. 1½d. B.I.C.C. came back from 58s. 9d. to 57s. 3d.

Vickers weakened to 30s. 9d. under the influence of the interim progress report, and steel shares generally showed declines compared with a week ago.

Ransome & Marles 5s. shares were firmer at 16s. 6d., and Pollard Bearing 4s. share gained 9d. at 36s. 9d. Pressed Steel 5s. shares were maintained on balance at 19s. 3d. Dowty Group 10s. shares gained a few pence at 34s. 4½d.

Forthcoming Meetings

Sept. 30 (*Sat.*). Talyllyn Railway Preservation Society. Talyllyn Special, 1961. Paddington, 8 a.m.

Sept. 30 (*Sat.*). The Permanent Way Institution, visit to Fisons Pest Control Limited, Saffron Walden.

Sept. 30 (*Sat.*). Branch Line Society. Excursion, The Pentland and Tinto Express.

Oct. 3 (*Tue.*). Institution of Civil Engineers. Three prestressed concrete railway bridges. 5.30 p.m. Great George Street, S.W.1.

Oct. 3 (*Tue.*). South Wales & Monmouthshire Railways & Docks Lecture & Debating Society. Railways from the outside.

Oct. 4 (*Wed.*). Electric Railway Society. Reminiscences and Review of Traction. Dr. E. L. Andrews, Assistant Electric Traction Engineer, British Railways. 7 p.m. 153 Drummond Street, N.W.1.

Oct. 4 (*Wed.*). Institution of Mechanical Engineers. Some speculations on the future of railway mechanical engineering. 5.30 p.m. 1 Birdcage Walk, S.W.1.

Oct. 6 (*Fri.*). The Railway Club. Modernisation in East Kent.

Oct. 7 (*Sat.*). The Railway Enthusiasts' Club. " Transport Journalism," Mr. W. T. Lambden. 7 p.m., Farnborough.

Oct. 9 (*Mon.*). The Institute of Transport. Presidential address. Mr. James Amos, C.B.E., M.Inst.T. 6.15 p.m. 66, Portland Place, W.1.

Oct. 11 (*Wed.*). Institution of Railway Signal Engineers. The reliability of electronic apparatus. 6 p.m. Savoy Place, W.C.2.

Oct. 14 (*Sat.*). Permanent Way Institution, East Anglia Section. Signalling for Modernisation.

Oct. 16 (*Mon.*). Historical Model Railway Society. Midland Railway Coaching Stock.

Oct. 18 (*Wed.*). Railway Students Association. Presidential address. Mr. A. R. Dunbar, O.B.E. 6.30 p.m. London School of Economics.

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Applications should be addressed to Mr. R. P. Beddow, C.B.E., Chairman, Southdown Motor Services Ltd., Stratton House, Piccadilly, London, W.1, to reach him not later than October 11, 1961.

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Photograph by courtesy of the Chief Civil Engineer, Eastern Region.

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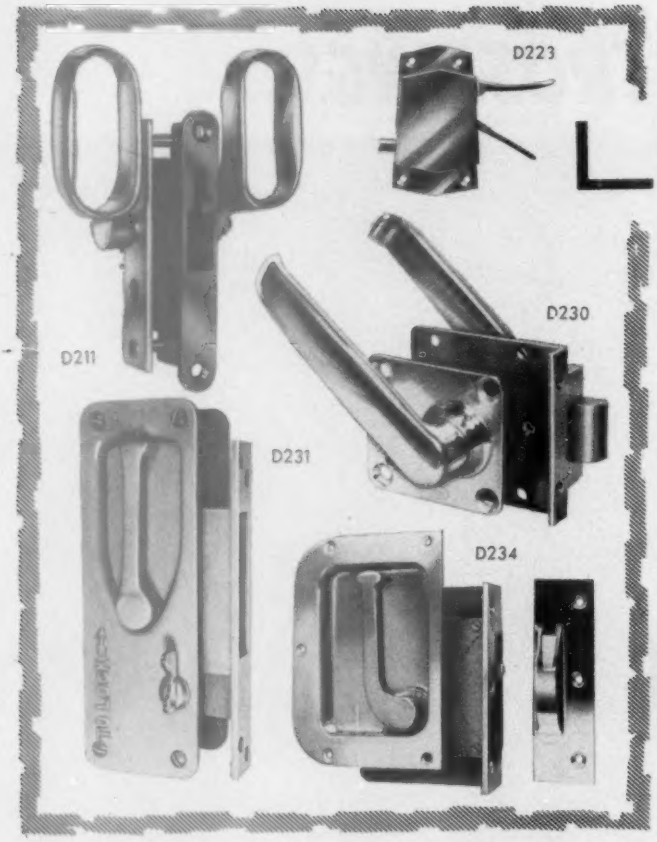

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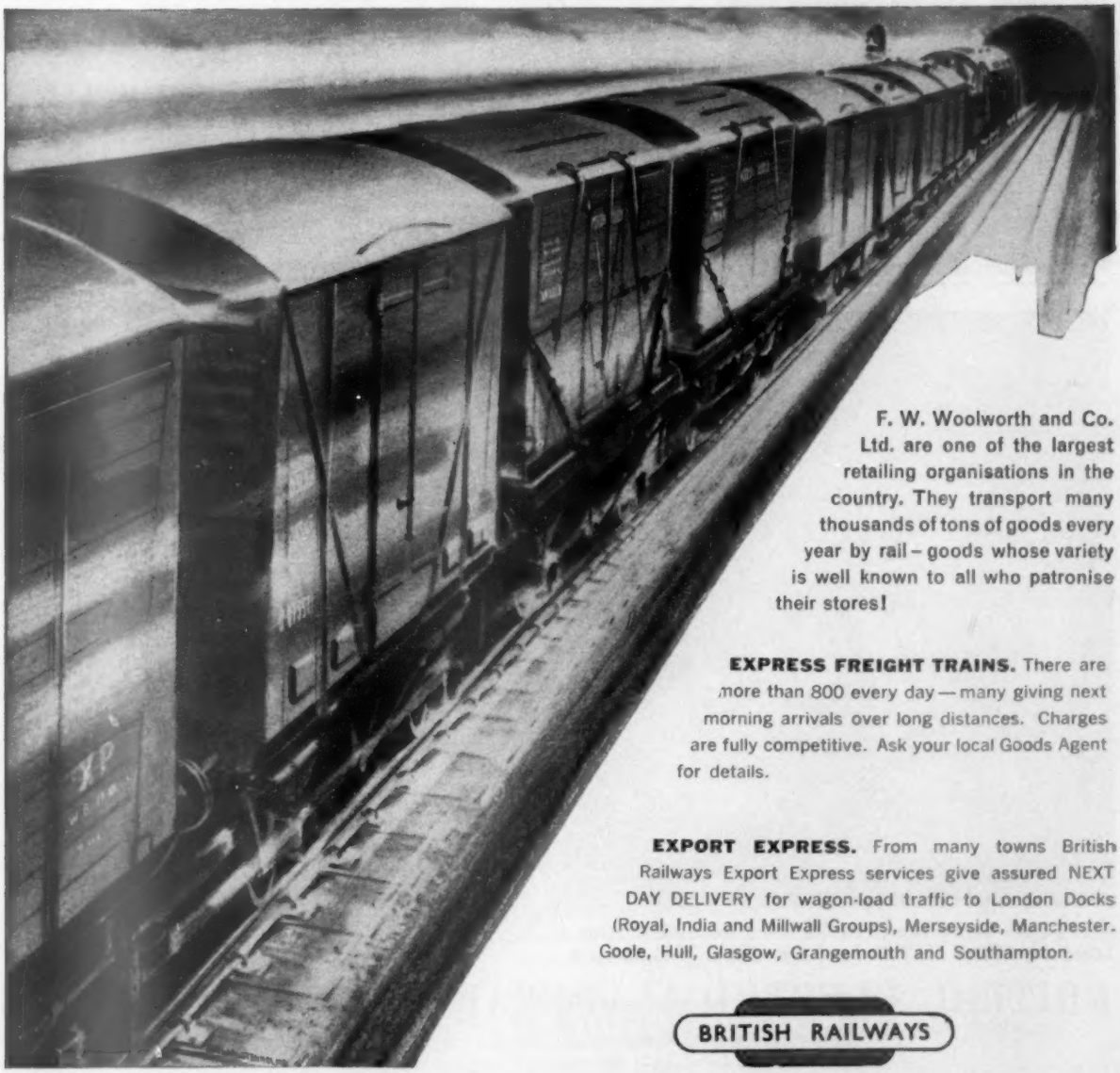

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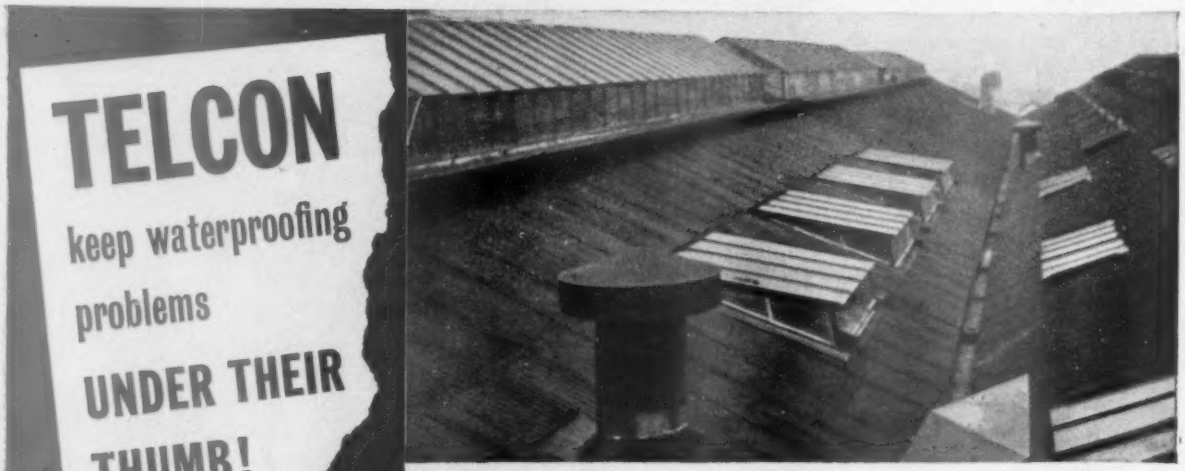

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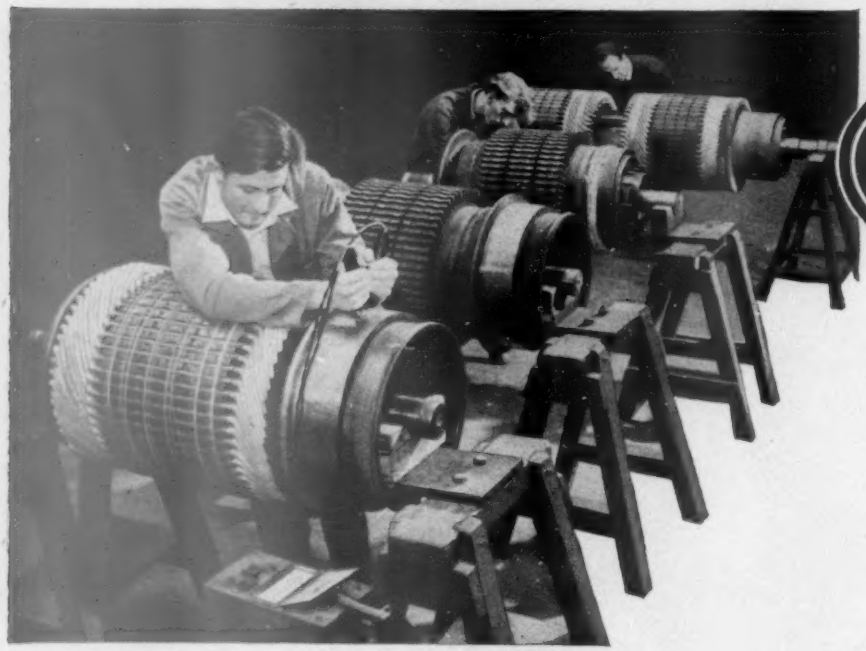

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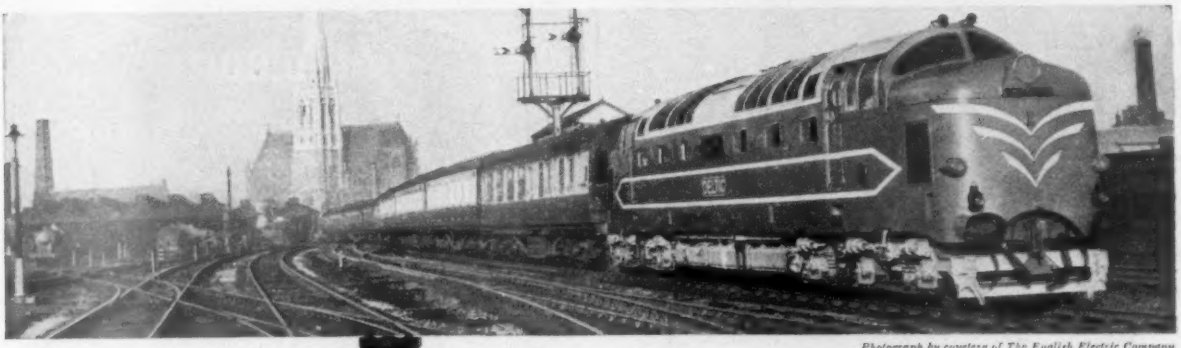
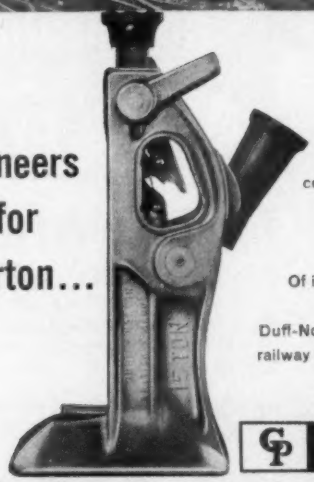


Photograph by courtesy of The English Electric Company

railway engineers make tracks for Duff-Norton...



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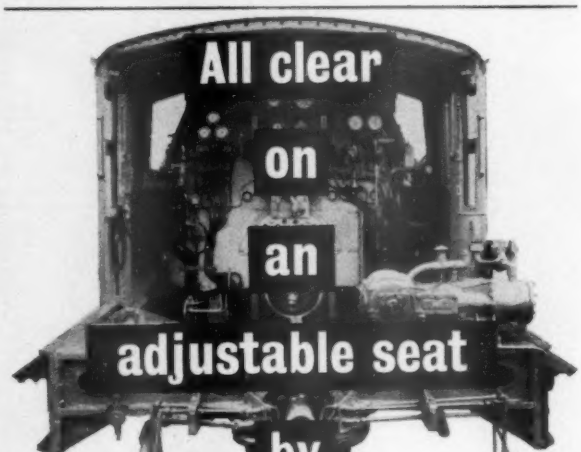

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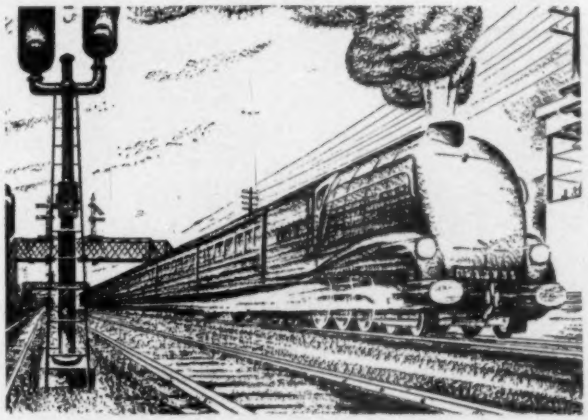

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